THE OIL WEEKLY

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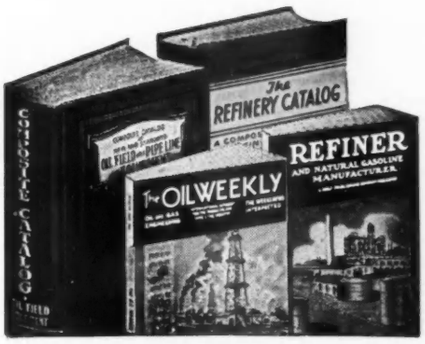

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The Oil Man's Calendar

MAY	
2– 3	Petroleum and Natural Gas Conference, State College, Pa.
5– 8	American Gas Association, Natural Gas Section, Dallas.
10–11	West Texas Geological Society, Spring Field Trip, Fort Worth.
13	Independent Petroleum Association of America, Semi-Annual Meeting of the Board of Directors, San Antonio.
19–22	American Petroleum Institute, Mid-Year Meeting, Tulsa.
26–29	National Association of Purchasing Agents, Chicago.
29–31	National Oil Scouts & Landmen's Association, Dallas.
JUNE	
7	Illinois-Indiana Petroleum Association, Robinson, Illinois.
9–10	Liquefied Petroleum Gas Association, Pacific Coast Section, San Francisco.
16–20	American Society of Mechanical Engineers, Petroleum Division, Kansas, City, Mo.
19–20	Pennsylvania Grade Crude Oil Association, Bradford.
	Kentucky Oil & Gas Association, Mid-Year Meeting, Lexington.
SEPT.	
8–12	American Chemical Society, Atlantic City.
NOV.	
2– 7	American Petroleum Institute, Annual Meeting, San Francisco.

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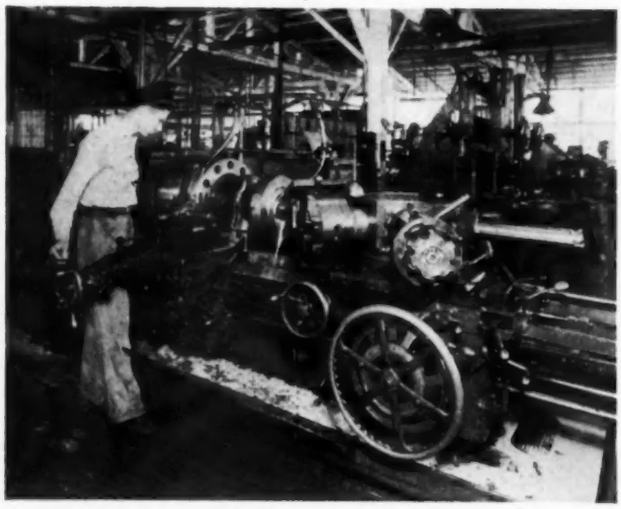

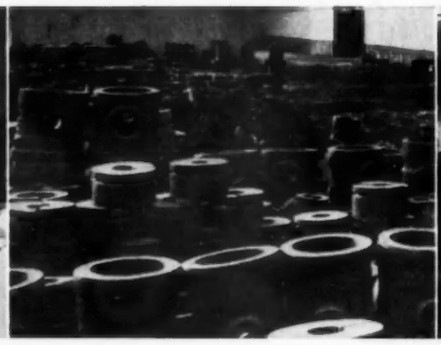

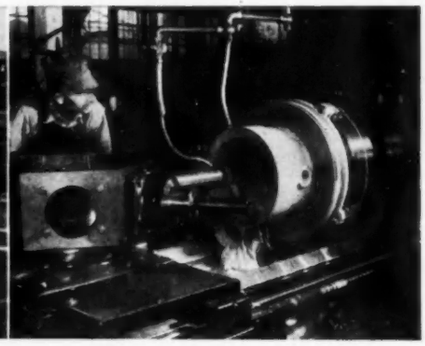

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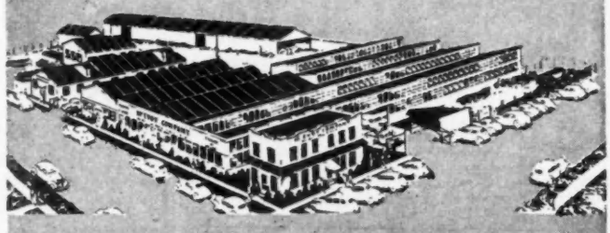

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THE OIL WEEKLY

APRIL 28, 1941

VOLUME 101 NUMBER 8

The Changing Panorama

LAST WEEK THE OIL WEEKLY touched on some of the practical reasons why both from the standpoint of the state and of operators there, Illinois should adopt a sound conservation law.

One important reason was purposely omitted—Illinois' membership in the Interstate Oil Compact would really mean something and one of the greatest arguments for federal control would be removed if the Illinois membership were in fact as well as name.

Apparently the oil industry will escape federal control this year—at least insofar as Congressional legislation is concerned—and Illinois consequently will escape it also. There are those who feel that under federal oil control exercised by Harold Ickes, a citizen of Illinois, some operators in that state would feel the federal yoke in an exceptional manner.

Illinois is taking a real chance by her failure to act, and Illinois is laying the oil industry liable to a great deal of criticism on the part of those who point to failure of that state to have a conservation law, as evidence of a nation-wide oil industry disregard of conservation.

The fight for federal control, although it promises to subside for a season, is not over. Illinois should remember that.

Government Buying . . .

The federal government, which bought roughly a million barrels of high-octane gasoline for the Army and Navy in February for delivery during February and the following three months, is now getting into the market under new specifications, calling for 1,300,000 barrels of high-octane gasoline to be stored for delivery on quick demand. The specifications provide that the gasoline must be stored by the refiner in quantities specified "over and about your normal requirements." This order is scheduled to be placed July 1 and is stimulating tank construction inquiries on the one hand while it is giving some advantage to the refinery with surplus storage on the other.

Also, in July an additional order for about a million barrels of high-octane gasoline is expected, for delivery over July, August, September and October. As a result of these government orders, plus an increasing consumer demand for high-octane gasoline, such gasoline is not as plentiful now as it was some time ago. Low-octane gasoline, on the other hand, seems to be plentiful.

Oil Price Control . . .

The grapevine brings rumors that Leon Henderson is planning to apply his price-control powers to the oil industry next. The rumors have not been confirmed and may have been occasioned by the steel-price situation. We have wondered what the attitude of the government, under price control, would be toward the price of a product when heavy increases in taxes and general production costs, including labor, came about through means beyond the control of the producer.

Except on Dry Holes? . . .

The regional director for the wage-and-hour law in the Mid-Continent months ago held that the terms of the law applied to drilling contractors on the ground that they were engaged in developing a product which went into interstate commerce. The matter, however, has never come to the test of the courts. We wonder what the ruling would be on a contract job which resulted in a dry hole!

Old Timer Passes . . .

The panorama changes indeed. News has just been released that the oldest refinery in the State of Texas is to be closed down in June—Magnolia Petroleum Company's plant at Corsicana, built originally to handle Corsicana crude before the days of Spindle Top. Reason—rehabilitation and modernization of the company's plant at Fort Worth, making the Corsicana plant unnecessary.

Questions and Answers . . .

A lot of talk about further steps toward the restoration of crude prices to the 1937 level • • • Texas producers, already heavily burdened with state taxes, are facing another straight upward hike in gross production tax • • • More talk about raises for oil company employes • • • Sidney Hillman was appointed, we all supposed, to keep the CIO in line on the defense program. Sidney, where art thou? • • • For sale, several hundred barrels per day of Ranger crude—rich in bright stocks • • • Also for sale, 600 barrels of South Louisiana crude also reported rich in lube stocks • • • Query—could Secretary Ickes' urge to be oil czar have anything to do with any personal animosity he might have toward certain well known oil men, an animosity which might date back to the secretary's early political days? • • • In a certain Southwestern oil city recently a survey was made of the various civic drives under way, and of the non-salary positions of responsibility held in such enterprises by oil men. Some eight such enterprises, all of them worthy causes in that particular city—and eight oil men at the head and doing the work of raising funds for them. Apparently oil men have been created for two purposes—to produce tax money

and to do community work • • • Which reminds us, a member of the Texas House of Representatives once asked us if the officials of a certain large oil company were actually accepted in Houston society. He seemed surprised when he was told of their fine standing and services. "You'd never believe it, from what we legislators hear about that company and its officers," he said.

War and Treaties . . .

News from the war front in Europe continues along the trend that may vitally affect North and South American crude oil shipments. It is not too much to say that the fields of Iraq and Iran are now being definitely threatened. Which reminds us of the words we heard from a man whom we consider one of the best informed men in the United States from an international standpoint. Last November he told us that efforts toward a treaty between Japan and Russia were under way with the assistance of Berlin. At that time he told us that a part of the deal was the recognition of Japanese rights in Manchukuo, recognition of Russian rights on the so-called Chinese railroad, a free hand for Japan toward the East Indies, stoppage of aid from Russia to China, and a free hand, as Russia's portion, toward Iran and India. The first two of these trades has been made public in connection with the treaty. The third is implied in dispatches from Berlin and Rome and the fourth has been denied. Nothing has been said about the fifth and sixth, but our friend has been so universally well posted in his information that we wonder about five and six.

Costly Experiment . . .

Mexico's oil operations since expropriation have really made a dent in the government treasury. It is figured that the republic has lost taxes of all kinds previously paid by the oil companies amounting to about one hundred and fifty million pesos per year, or a total of four hundred and fifty million pesos during the three years of government operation. Added to that is a loss on operations amounting to in excess of one hundred and fifty million pesos during the three years time—a total loss in revenues of six hundred million pesos in three years time • • • Incidentally, Bolivia is also having financial troubles as a result of her expropriation of oil properties several years ago. Instead of an income Bolivia has also suffered a loss • • • Which reminds us of a story we heard not long ago about another country where the government is in the oil business in a big way. It appears that the representatives in the national governing body from a certain area were not voting just right. They "got right" under the pledge of the government that it would drill a well in the area. The well was drilled—was a dry hole, nobody expecting anything different, but the area profited from the dry-hole money spent.

Equipment Company Earnings

Earnings of equipment companies selling to the oil industry generally are following the upward trend of the oil industry itself. Annual reports of 30 nationally established such companies showed total earnings in 1940 of $115,907,451, an increase of 12 percent over the $103,489,070 total of 1939. Twenty-two showed increased earnings in 1940, six showed decreased earnings, one showed a profit as against a loss the previous year, and one showed a loss.

Oklahoma City Secondary . . .

Deepest water flood program in operation so far as known exists in the southern portion of the Oklahoma City field. A "natural" flood was automatically started in the 6500-foot Wilcox sand. Although several producers have been ruined by water in the early stages, results to date indicate the ultimate recovery will be greatly increased by this phenomena.

Secondary recovery by gas injection in the Oklahoma City field is not a new subject nor requires no "guinea area" for its merits. Several major companies have been repressuring leases in the south end of the field in Wilcox sand for over three years. Mere investigations of their recoveries to date would convince any opposition of the ultimate returns to be had by this procedure. Twenty-two operators have already spent in excess of $150,000 for composite engineering surveys and legal fees on this program.

Gleanings

Among wells contesting for "deep honors" is Shell Oil Company's Norman Breaux B-1, in the West Lake Verrett field, Louisiana Gulf Coast, completed recently at 11,520 feet, making 360 barrels daily of 30-gravity oil through an eight-inch choke. • • • American airplane deliveries reached an all-time peak of 1216 in March, but possibilities for further immediate increases are not bright as some special metal parts shortages are beginning to pinch output. • • • The approximately 1,560,000 cars and trucks manufactured during the first 3 months of 1941 was 19 percent greater than a year ago, and even exceeded the 1,546,311 units made during the first quarter of 1929. • • • The Temporary National Economic Committee's million-dollar three-year investigation of United States industrial economic power finds high competition in the automobile industry, where three companies have 89 percent of the business; but in the oil industry 20 companies controlling 85 percent of refining are said to constitute a monopoly. • • • An Australian government committee, seeking a substitute motor fuel, has recommended use of surplus sugar crop. A supply of 4,000,000 gallons annually is needed. The United States oil industry has plenty of natural gasoline, but apparently needs tankers • • • Some kinds of oil country supplies being affected by demand for alloy steels • • • Some difference now and back in 1917 when the United States entered the war. Materials for drilling and refining had right of way then. Labor troubles, though, bedevilled the industry. We remember troops in some of the fields. Names of some of the boys connected with the oil-field workers union have a strangely familiar ring. A few of the union leaders even in those days put their opportunity ahead of their country's need • • • Compliments to The Texas Company on its advertisement in last week's *Saturday Evening Post.*

Controlling Energy-Oil Ratios With Bottom-Hole Chokes

By I. B. WILLIAMS, Williams Flow Process

IN OIL reservoirs where the energy is the dissolved gas energy alone, or is partly dissolved gas energy and partly undissolved gas under pressure, the true significance and value of a low *energy-oil ratio* in oil production are not always appreciated. It is true, there is always considerable discussion and hope for low gas/oil ratios, but in the main very little scientific thought and effort are put forth to attain that end. This article applies to this important subject, particularly as it applies to the conservation of that energy as a lifting force.

In an oil-gas reservoir there is a definite amount of inherent energy and it is an exhaustible supply. Any quantity of gas that is released from the reservoir in any manner, represents a definite amount of that potential energy that has been lost from the reservoir supply. If the amount of energy released from the reservoir with each barrel of oil is high, extraction of oil from the reservoir will be proportionately low.

In another approach to the same question of gas volumes per barrel of oil produced, the reservoir when first drilled contains a definite and total amount of energy. The total energy can readily be depleted by producing practices not consistent with reservoir conditions to the end that the energy of the reservoir is gone with only a minimum volume of oil being produced to the surface. A producing practice that allows the reservoir energy to be exhausted only as it performs useful work of lifting a maximum load of oil per unit of applied energy is a progressive and desirable practice regardless of gas/oil ratios.

Any gas-oil ratio of an oil well should be considered only as a measure of the amount of energy that is released from that portion of the reservoir that is influenced by the well. The comparison of the gas/oil ratio of one well with that of another in terms of gas volumes alone, is generally useless unless all the factors of each reservoir or each influenced portion of the reservoir were exactly the same. A low gas/oil ratio from a high-pressure reservoir may release several times as much energy per barrel of oil as a higher gas/oil ratio would from another reservoir of lower pressure. The use of the term gas/oil ratio, wherein only the volume of the gas is considered, which is often the practice, is frequently misleading, because no record of the amount of energy that is involved is disclosed. A more fitting term to be used would be *energy per barrel of oil* or *energy-oil ratio.* That would at least be a definite yard stick to compare efficient use of the energy in the production of oil.

Types of Reservoirs

Oil reservoirs may be classified as follows:

(1) A reservoir in which there is complete saturation of the dissolved gas in the reservoir oil in accordance with the reservoir pressure, the composition of the dissolved gas and the type of oil and with little or no excess gas forming a gas-cap.

(2) A reservoir with complete saturation of dissolved gas in the reservoir oil and in addition with considerable excess gas which forms a troublesome gas-cap.

(3) One in which the reservoir oil is not saturated with dissolved gas. The oil in this type of reservoir may or may not have been saturated with dissolved gas at some original pressure that was lower than the present pressure. For example a reservoir oil could have been saturated under 700 pounds per square inch pressure, but not saturated under a present pressure of 1500 pounds per square inch. The latter made up mostly of hydrostatic pressure.

There are other types which have very little gas, such as those which are clearly hydrostatic, those which are natural water-drive or water-carrier and stripper reservoirs. Many of the stripper type of reservoir which have depreciated from gaseous reservoirs contain small amounts of dissolved gas energy in the oil. This last remaining energy should be carefully conserved and used efficiently in order to extract as much oil as possible from the sand to the bottom of the well, from which the pump or other suitable method may lift. There remains but slight chance of using this remaining energy in lifting.

General Method of Handling the Energy

A general method or outline of the methods of handling the energy in the three types of oil-gas reservoirs is here given, followed by a detailed study of Type (1) which is most important from an energy-oil ratio point of view, and is of wide occurrence throughout the oil provinces.

(1) This type of reservoir can be handled without much difficulty by methods which adjust the application of the energy to various phases to secure the maximum efficiency that is feasible and thereby (a) obtain the smallest differential flowing pressure from the reservoir sand to the well bottom that is consistent with the required oil production, (b) obtain the minimum energy use (in terms of gas/oil ratio) in lifting the oil from a predetermined elevation in the well to the surface and (c) prevent the release of any energy of the dissolved gas from the reservoir oil, in excess of that amount that is currently required for producing oil. Released gas that is not currently needed and used forms gas-caps which are sources of enormous energy dissipation. The ever enlarging gas caps thus formed continuously interrupt and unbalance steady uniform oil production in addition to dissipating energy.

(2) In this type of reservoir the formation dissolved-gas energy is handled and adjusted in exactly the same manner as that in Type 1. The excess gas-cap gas is handled in either of three ways,

(a) shutting off by cementing which is best in the long run when it is possible, because this does, or tends to revert the wells back to those of Type 1 reservoir, (b) oil-sealing or "oil-killing" of all or even a part of the excess gas by maintaining high working oil fluid levels. This dampens or depresses the active energy of the excess gas, (c) if neither a nor b is practical, then temporary production of a limited amount of gas under a carefully controlled bleeding operation at the casing head should be carried out. Such bleeding operation must be conducted in such a manner as to prevent any interference or unbalancing of the formation adjustments and operation as previously established. After a short period, the adjustments and coordination of pressures at the bottom of the well make it unnecessary to continue the bleeding operation at the casing head. The bleeding operation produces a well-bottom condition that insures a correct oil fluid working level and the correct working fluid level pressure. The maintenance and control of the correct oil fluid level permits the use of the oil as a sealing agent on the excess gas-cap gas as described above.

(3) In handling this type of reservoir, whatever formation dissolved-gas energy there is in the reservoir oil would have to be used at the best efficiency possible in order to secure the maximum oil production from the sand to the bottom of the well. Auxiliary gas energy would then have to be used to lift the oil to the surface. The auxiliary gas pressure would have to be used in such a manner that the formation dissolved gas energy may operate unrestricted, otherwise decreased oil production would result. If less than maximum well capacity were desired, a bottom-hole-differential pressure adjustment in the tubing should be made to obtain the desired amount of production.

Reservoir Information

Before a satisfactory gas/oil ratio for the production of oil from a reservoir can be made, it is necessary to obtain complete information and a complete knowledge of the characteristics of the reservoir as follows:

(1) The total amount of oil in the reservoir or in the well location area of the reservoir.

(2) The total amount of dissolved gas in the reservoir oil, together with other energy sources such as hydrostatic pressure and the amount of undissolved gas under pressure.

(3) The total amount of inherent gas as (a) the dissolved gas energy, (b) hydrostatic energy and (c) energy in the undissolved gas under pressure.

(4) The total amount of oil that is producible

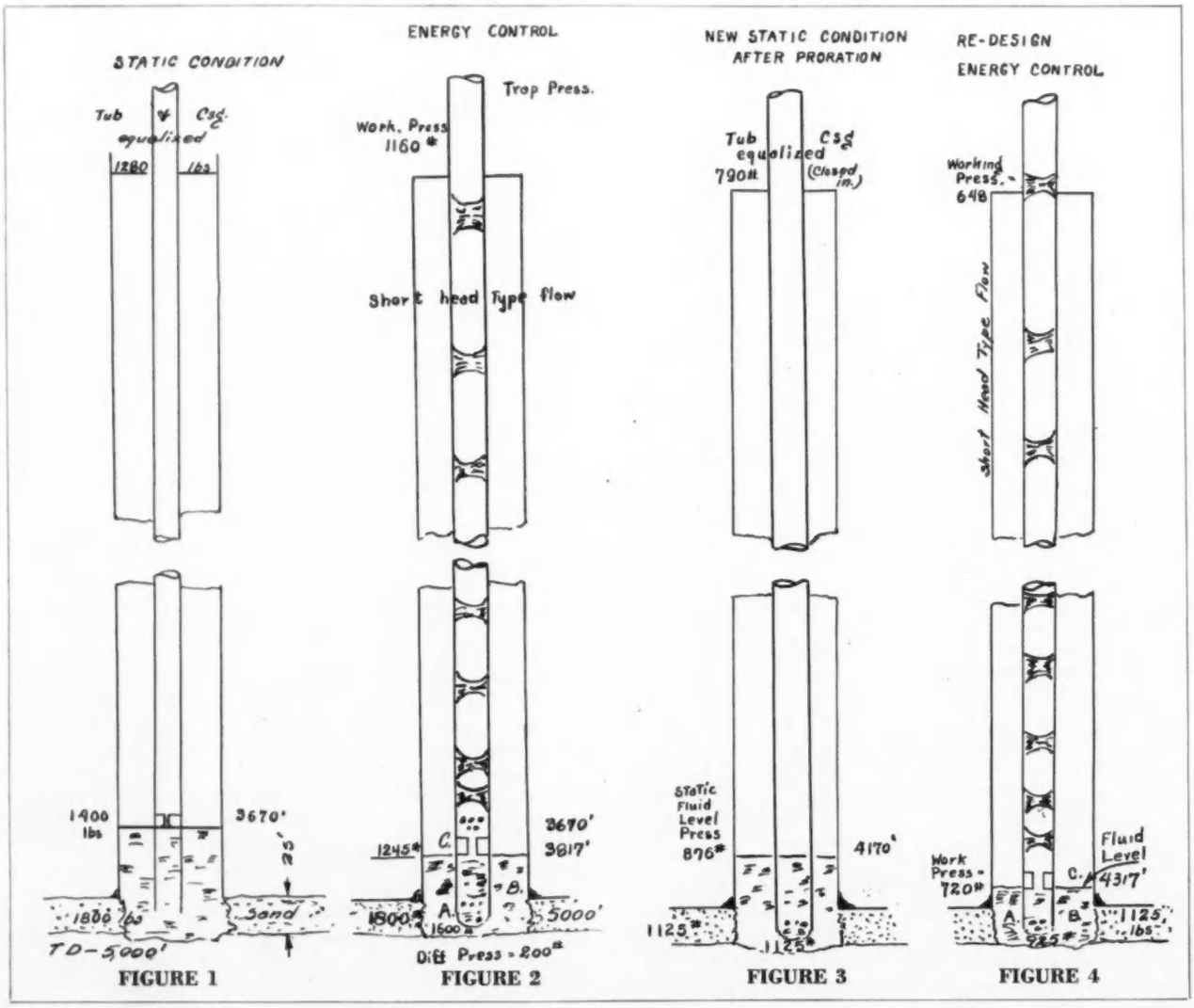


FIGURE 1 FIGURE 2 FIGURE 3 FIGURE 4

with the inherent reservoir energy in whatever form the potential energy exists, with consideration to (a) the sand grain surface area residue oil, (b) the minimum lifting energy required and (c) the minimum differential energy required. The amount of producible oil per location will allow an intelligent use of the energy to be made, in order to secure the greatest economic extraction of oil from the reservoir. The greater the amount of oil that can be produced by the reservoir energy the less will be the necessity to resort to expensive secondary methods such as re-pressuring, water flooding and such.

Reservoir detail typical of Factors variable with depth in Rodessa, in South Central and South Texas and in some of the more shallow fields of West Texas follows:

Depth	5000 feet
Net producing sand thickness	25 feet
Porosity of the oil-producing sand	20 percent
Reservoir pressure	1800 lb. per sq. in.
Well locations	10 acre
Gravity oil	40°-41°
Specific gravity of gas (air—1)	0.70
Potential capacity wells	400 bbls. per day
Differential pressure for 200 bbls. daily as shown by pressure survey	190-200 lbs. per sq. in.
Effective sand grain size	150 mesh
Gas-oil ratio noted during stabilized differential flow tests	8454 cu. ft. per bbl.

Figure 1 shows reservoir and well conditions just prior to the static-pressure survey. Pressures noted were obtained by pressure survey.

The total oil content per 10 acre well location area of the reservoir is

$$\frac{435{,}600 \times 25 \times 0.2}{5.61} = 388{,}235 \text{ bbls.}$$

The total volume of free gas dissolved in the 10-acre area of the oil reservoir is,

$$388{,}235 \times 1800 \times 0.254 = 177{,}413{,}395 \text{ cu. ft.}$$

The total potential energy of this amount of dissolved gas is,

$$177{,}413{,}395 \times \text{Log.}_e \frac{1815}{15} \times 144 \times 15 = 1{,}836{,}000{,}000{,}000 \text{ ft. lbs.}$$

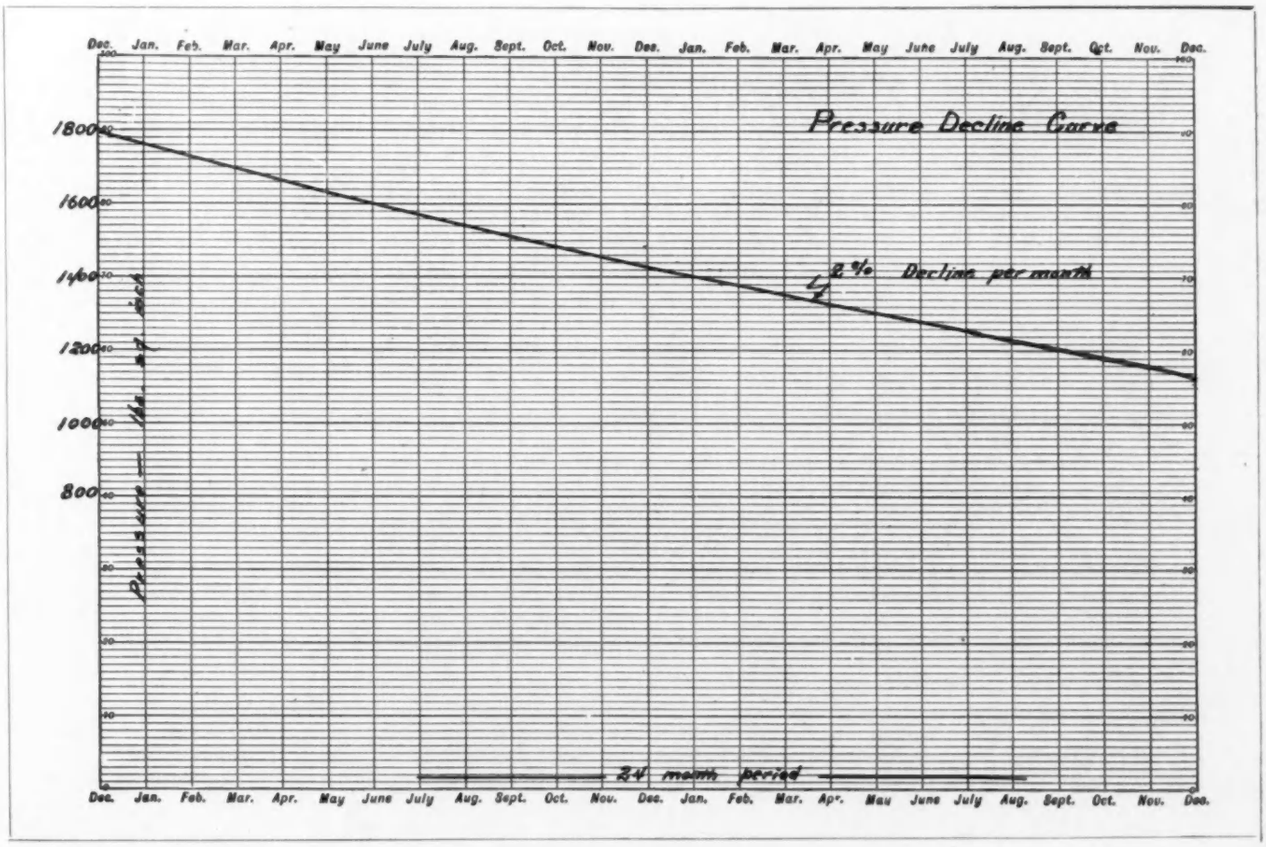
Figure 2 shows how the well would be produced under an energy control bottom-hole choke method and with correct allocation of energy to the various functions it has to perform.

Energy Control

The first step is the establishment of the required differential producing pressure from the sand reservoir to the well bottom. This is accomplished by the use of a correct size oil-inlet choke which will permit only 200 barrels per day to enter the lower end of the tubing. This oil-inlet choke size has to be very carefully selected so that the correct differential producing pressure will be obtained, otherwise either too little oil production per day will be produced through the sand or there will be energy released from the reservoir oil in excess of that actually required.

When the correct differential pressure has been established, the static oil fluid level is drawn down or lowered from 3670 feet as shown in Figure 1, to a working fluid level at 3817 feet from the top of the well. The static oil fluid level pressure of 1400 pounds per square inch is reduced to a working fluid level pressure of 1245 pounds. Figure 2 shows the pressures and the working fluid level after the establishment of the correct differential.

The dissolved gas energy in each barrel of oil at the working fluid level under 1245 pounds per square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inch pressure goes through the oil-inlet choke with the oil and this energy per barrel of oil equals,

$$316 \times 144 \times 15 \times \text{Log}_e \frac{1260}{15} = 3{,}024{,}120 \text{ ft. lbs.}$$

The occluded gas that has been released from the reservoir oil by the reduction of pressure from the reservoir pressure of 1800 pounds per square inch to the working fluid level pressure of 1245 pounds is associated with the oil below the choke-inlet to the tubing and contains energy per barrel of oil equal to

$$142 \times 144 \times 15 \times \text{Log}_e \frac{1260}{15} = 1{,}358{,}940 \text{ ft. lbs.}$$

There is then a total of 3,024,120 plus 1,358,940 or 4,383,060 ft. lbs. of energy available to lift each barrel of oil 3817 feet to the surface, which is an energy lifting efficiency of,

$$\frac{1{,}106{,}930}{4{,}383{,}060} = 25.2 \text{ percent.}$$

The required gas-oil ratio is then

$$\frac{3818 \times 290}{0.252 \times 144 \times 15 \times \text{Log}_e \frac{1260}{15}} = 461 \text{ cu. ft/bbl.}$$

The total amount of energy in 461 cubic feet of dissolved gas is, 4,769,506 foot pounds and the allocation of this energy to the various efforts performed in producing a barrel of oil is as follows:

	Ft. Lbs.	
Energy per barrel of oil forcing oil through sand pores from the reservoir to the well-bottom.....	42,876	0.9 percent
Energy per barrel of oil raising oil to the working fluid level.....	343,570	7.1 percent
Energy per barrel used in lifting from working fluid level to surface.	4,383,060	92.0 percent

The over-all efficiency in the use of the energy is

$$\frac{1{,}463{,}800}{4{,}769{,}506} = 30.7 \text{ percent}$$

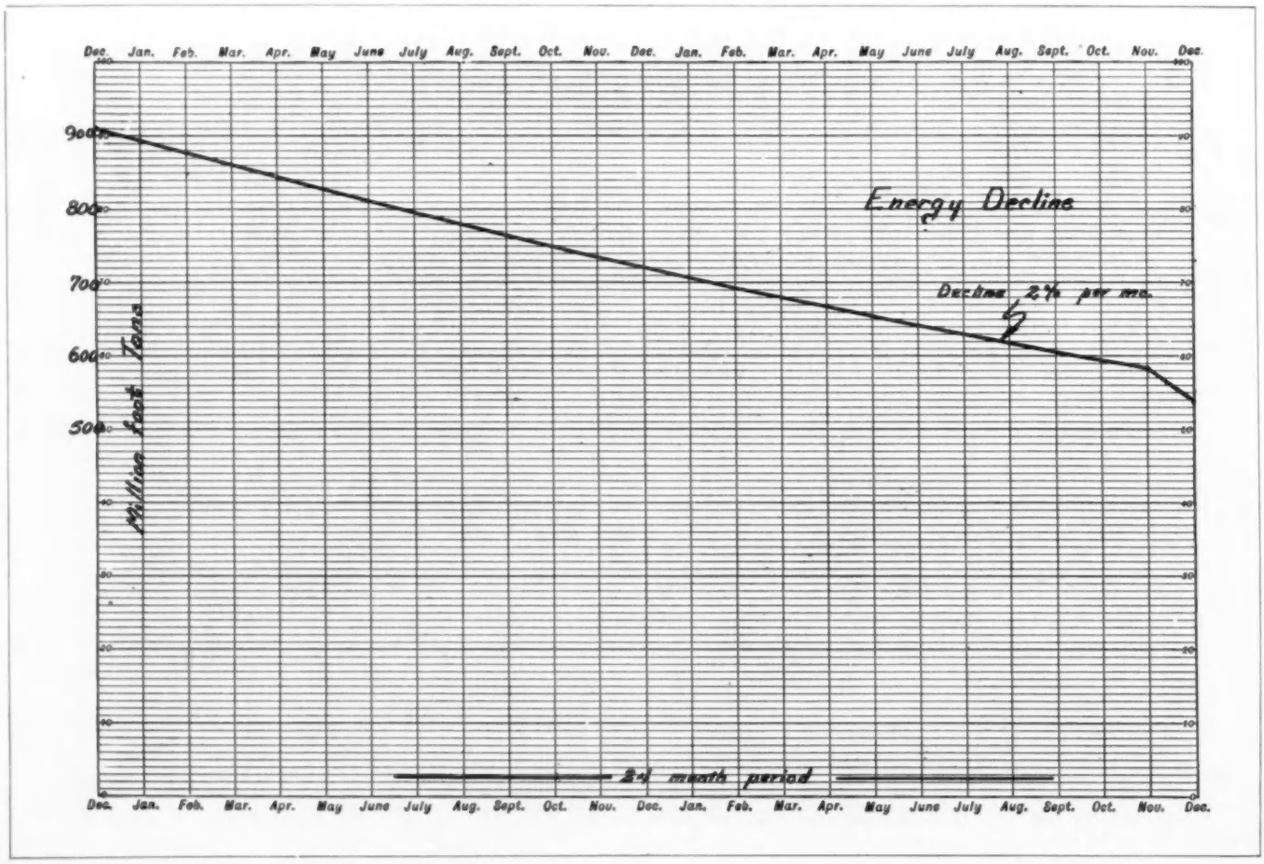
The apportioning of the lifting energy to insure the set-up as shown in Figure 2 and the results shown on the Curves B of the Energy, the Gas Volume and the Oil Production curves is as follows:

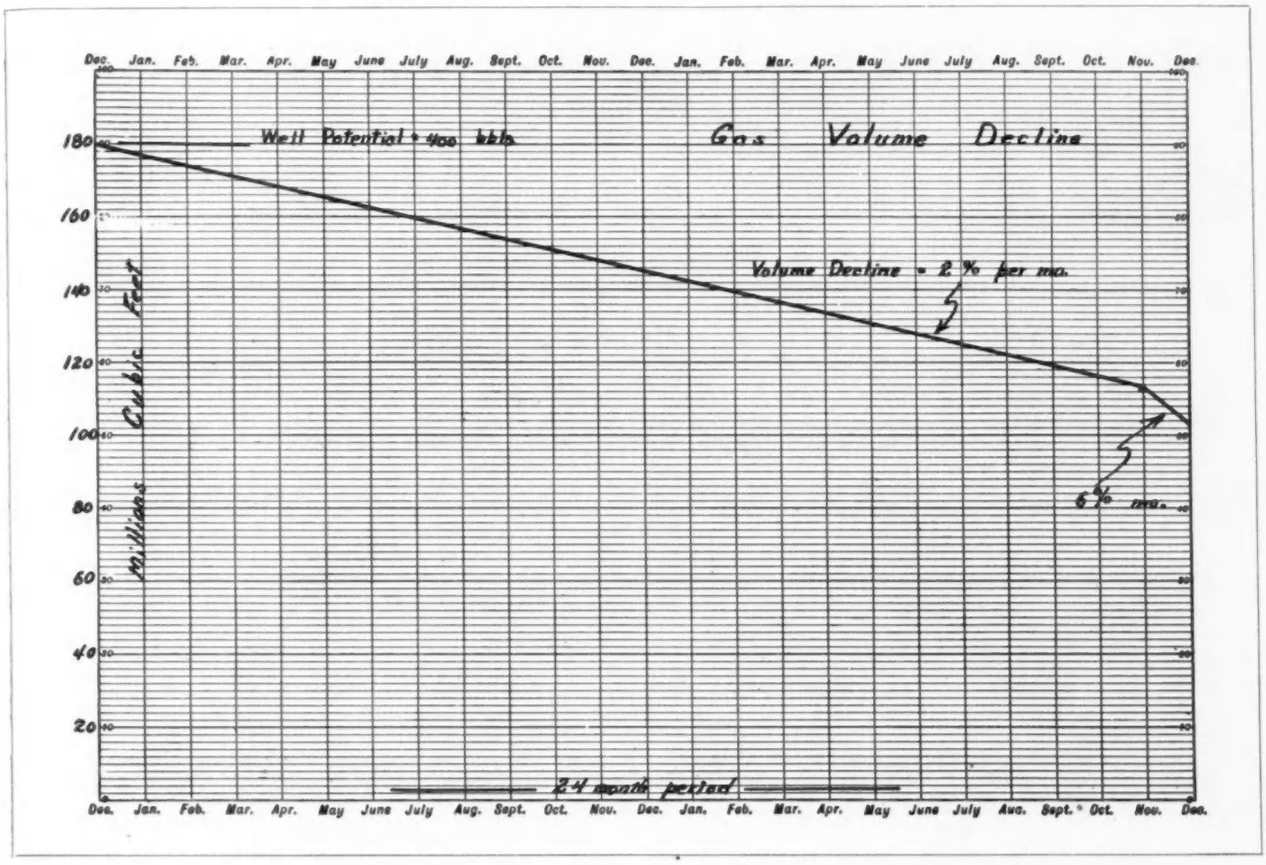
(1) The dissolved gas energy that yet remains in the oil at the working fluid level, passes through the oil inlet choke with the oil into the tubing. This dissolved gas energy is converted into kinetic energy progressively as the pressure is gradually reduced toward the surface. Each barrel furnishes 316 cubic feet of free gas when it is finally at atmospheric pressure. This amount of gas supplies 3,024,120 foot pounds of energy.

(2) There is also 142 cubic feet of undissolved occluded gas under 1245 pounds per square inch pressure at the working fluid level of and below the oil-inlet choke. This is the gas that has been released from the dissolved state in the reservoir oil by the reduction of pressure from 1800 pounds, the reservoir pressure, to the working fluid level pressure of 1245 pounds. The energy in this amount of gas is 1,358,940 foot pounds for each barrel of oil produced.

(3) A small amount (about 5 percent) of this occluded gas forces oil through the oil-inlet choke and enters the tubing with the oil. The balance of it is directed and arranged to be admitted into the tubing above the working fluid level, in order that no expansion of this gas takes place below the oil-inlet choke. In addition, the admission of the gas above the working fluid level prevents the building up of volume of gas above the working oil level, which action would push the oil fluid level downward until it finally unsealed the lower end of the tubing and entered the tubing at that position, because the gas cannot exert kinetic energy until it can expand.

The energy available from the dissolved gas and


Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
Energy Decline
Decline 2% per mo.
Million Foot Tons
3rd month period
Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.



from the occluded gas per barrel of oil is

$$3{,}024{,}120 + 1{,}358{,}940 = 4{,}383{,}060 \text{ ft. lbs.}$$

to lift 1 barrel of oil 3817 feet to the surface.

The efficiency then in the use of the energy in the lifting operation would be

$$\frac{3817 \times 290}{4{,}383{,}060} = 25.2 \text{ percent}$$

The lowest lifting gas-oil ratio then from an energy basis and by securing the maximum efficiency possible in the use of the energy throughout operation from the reservoir sand to the surface would be:

$$\frac{290 \times 3817}{0.252 \times 144 \times 15 \times \text{Log}_e \frac{1260}{15}} = 461 \text{ cu. ft./bbl.}$$

Referring to the Energy Control shown on Curve B on the Production Decline Curve it is seen that this method produces the allowable of 200 barrels daily for 23 months. The potential capacity of the well would decline at 3 percent per month and at the end of 23 months the potential of the well would be reduced to 200 barrels. During this period the total production under proration would be 138,000 barrels, or 35.5 percent of the original oil content of the 10-acre reservoir area. The reservoir gas volume would be declined to 110,000,000 cubic feet, or 62.0 percent of the original volume in the 10-acre area. The reservoir pressure would have declined to 1125 pounds per square inch which is 62.4 percent of the original reservoir pressure of the 10-acre area. The reservoir energy would have declined to 1,140,000,000,000 foot pounds or 63 percent of the original.

With the changed condition in the portion of the reservoir influenced by the well, a new design and allocation of the energy is necessary, in order to continue the efficient use of the energy.

The new design for energy control production with the minimum gas-oil ratio obtained from an energy standpoint would be made with the static conditions (see Figure 3) in the oil reservoir after the potential capacity of the well has been reduced to about 200 barrels daily, after 23 months of prorated production.

The new design for the continued production under an energy control method is shown in Figure 4.

A differential producing pressure between the reservoir and the bottom of the well of 200 pounds per square inch is established in order to begin the new production phase at the maximum capacity of the well, namely, 200 barrels per day. Any smaller daily production, if desired, could be produced with better efficiency of the use of the reservoir energy.

When the correct differential pressure for producing 200 barrels daily is established by the correct sized oil-inlet orifice, the pressure conditions and working fluid level as shown in Figure 4 will result. The oil fluid level will be lowered from the static fluid level of 4170 feet to the working oil fluid level of 4317 feet. The static fluid level pressure of 876 pounds will be reduced to 720 pounds at the working fluid level. The bottom-hole producing pressure would remain constant at 925 pounds. The casing head working pressure would then be

$$\text{Log } P_s = \text{Log } 720 - .00001508 \times 4317 \times 0.70$$

P_s or the working casinghead pressure would be 648 pounds per square inch.

The required gas-oil ratio on a 25-percent energy efficiency basis would be

$$\frac{4317 \times 290}{0.25 \times 144 \times 15 \times \text{Log}_e \frac{735}{15}} = 595 \text{ cu. ft./bbl.}$$

The gas-oil ratio shows that there will be about

4 percent per month decline in the balance of the energy in the 10-acre well location area of the oil reservoir.

The well can be produced by this method until the reservoir pressure is reduced to 400 or 500 pounds per square inch.

By producing at 4 percent per month decline until the reservoir pressure was reduced to 500 pounds, the total number of months would be

$$N-1\ (\text{Log } 0.96) = \text{Log } \frac{500}{1125} = 21 \text{ mos.}$$

The oil production decline has been established at 6 percent per month decline which is amply conservative. The well could be produced at 4 percent per month production decline since there is sufficient energy remaining in the reservoir to do so.

The total production of oil by the method of energy control

Prorated production, barrels	138,000
Production at 6 percent per month decline until energy was depleted in about 29 or 30 months, barrels	90,000
Total barrels	228,000

This amount is 58.6 percent of the total amount in the 10-acre well location area of the reservoir.

With an effective sand-grain size of 150 mesh there would be approximately 2720 square feet of sand-grained surface area per cubic foot of reservoir sand. If the oil film residue retained on the sand grain surface area were as little as 5000 square feet per gallon, there would be retained about 146,000 barrels on the sand surface area of the 10-acre portion of the reservoir.

An effective sand-grain size in this connection is considered to be a sand made up of uniform equal-sized sand grains packed in the most compact manner, wherein the sand characteristics such as pore space, permeability, sand-grain area, pore area and so forth per unit volume, would be equivalent in production performance to the actual reservoir sand per unit volume. The actual reservoir sand, naturally, would be made up of a definite combination of various mesh grains of irregular shape and ranging in size from very fine dust to coarse. To state it another way, there is some ideal sand of even-sized grains uniformly packed in the most compact manner, that is equivalent to any given natural sand in characteristics and production performance, so that mathematical treatment of the ideal sand would apply to the natural sand.

Summation of Results

A summation of the results of the Energy Control Method follows:

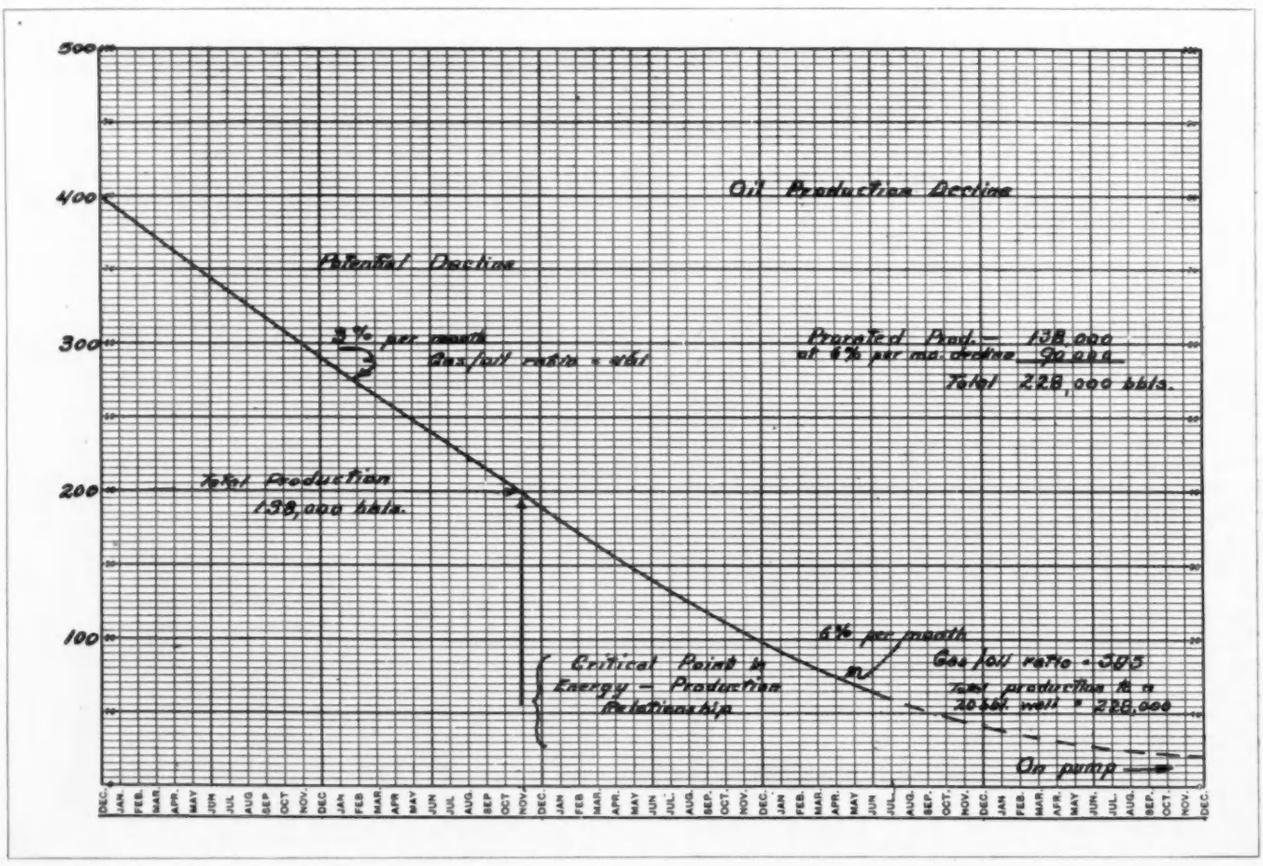
Total oil produced, barrels	228,000
Percentage of the total 10-acre reservoir oil content, percent	58.6
Total energy use, foot pounds	1,194,000,000,000
Percentage of the total reservoir energy content used, percent	65.0
Over-all efficiency in the use of the reservoir energy, percent	24.0

The percentages of the reservoir oil accounted for in the energy control production are as follows:

Production, percent	58.6
Retained as residue on the sand grain surface area, percent	37.4
Underground loss, percent	4.0

The total amount of recoverable oil from this type reservoir would be very close to 60.0 percent of the original reservoir oil content.

In conclusion, increased efficiency is secured in production of oil by the correct handling of the inherent energy that is supplied in the reservoir with the oil.



Selection of Pump Size

For Optimum Sucker-Rod Pumping Conditions

By E. N. KEMLER
Associate Professor of Mechanical Engineering
Purdue University

PRODUCTION of a given quantity of oil using sucker-rod pumping equipment can be made with any one of an infinite combination of plunger sizes, stroke lengths or pumping speeds. Practically, there are limits on length of stroke which may with existing equipment vary from about 12 inches to 120 inches and practical pumping speeds would correspondingly vary from about 35 to 8 strokes per minute. Even with these limitations on stroke and speed a wide variation in plunger size is possible to give a required production. For normal pumping speeds and strokes it is desirable to select that plunger size and cycle which will be easiest on the equipment.

The following discussion will deal with the analysis of those conditions which will lead to the best balance between equipment elements, giving particular attention to plunger diameter for best conditions. The data presented are an attempt at formulating this important problem. The charts offer a quick and simple method of solution of the equations. Because of the large number of variables involved it is desirable to have some general method of approach to the problem. These charts will form an introduction to this problem and the checking of optimum field conditions against the charts.

In equation 1 and the other equations to be used the following symbols and units are involved:

For normal speeds the Slonneger formula

$$P_{max} = (W_o + W_r)\left[1 + \frac{LN}{5400}\right]_{(1) \text{ or } (3)} \quad \ldots\ldots (1)$$

gives a reasonable solution for the maximum load. In the selection or operation of equipment, well load is of importance because it determines the stress on the sucker rods and the pumping unit and because it determines in effect, the peak torque to be carried by the reducer and the prime mover. The lower this peak load the longer or better service which can be obtained from the equipment. Because of the large number of variables involved it is necessary wherever possible to limit the factors which will be permitted to vary.

In equation 1 and the other equations to be used the following symbols and units are involved:

W_o = Weight of fluid on plunger in pounds = .34 sd^2l
s = Specific gravity of fluid being pumped.
d = diameter of plunger in inches.
l = Fluid lift in feet.
W_r = Weight of sucker rods in pounds.
L = Length of stroke in inches.
N = Number of strokes per minute.
D = Well depth in feet or depth to pump if pump is not on bottom.
K = Average weight of sucker rods per foot in tapered strings.
$W_r = KD$
e = Pump volumetric efficiency.
Q = .117 e d^2NL.

If we substitute the various values in equation 1 it can be reduced to the form

$$P_{max} = (.34sd^2l + KD)\left(1 + \frac{Q}{630ed^2}\right) \quad \ldots\ldots (2)$$

Further, if we consider a well producing such that the fluid level is at the pump level, l will be equal to D and the equation will reduce to

$$P_{max} = (.34sd^2 + K)\left(1 + \frac{Q}{630ed^2}\right) D \quad \ldots\ldots (3)$$

In this equation, the s value (specific gravity) will be determined by the type of fluid being handled; the K value will be a constant for a given string of sucker rods; the Q value (production) will assume to be fixed by the well requirements, and the volumetric efficiency will be known or obtainable. The plunger diameter is, however, subject to some control. Since the plunger diameter occurs in more than one term in this equation it is possible that some value of a plunger diameter will give a lower value of load than some other value. For example, if the plunger diameter is decreased, the speed and stroke must be increased, whereas a larger plunger would permit this combination to be decreased, the best plunger diameter not being obvious by direct inspection. This plunger diameter to give a minimum load can be determined by taking the derivation of equation 3. The value which makes this equation zero will give the minimum load.

$$P_{max} = \left[.34\,sd^2 + \left(K + \frac{SQ}{1890e}\right) + \frac{KQ}{630ed^2}\right] D \ldots\ldots (4)$$

Taking the derivative of this equation with respect to plunger diameter (d) we get

$$\frac{d\,P_{max}}{d\,(d)}\left[.68s\,d + \frac{(-2)KQ}{630e\,d^3}\right] D \quad \ldots\ldots (5)$$

$$\text{If } \frac{dP_{max}}{d\,(d)} = 0 \quad \ldots\ldots (6)$$

Then

$$.68\,sd^4 - \frac{2KQ}{630e} = 0 \quad \ldots\ldots (7)$$

$$d = \left(\frac{KQ}{210se}\right)^{\frac{1}{4}} \quad \ldots\ldots (8)$$

This then gives a very simple expression for d in terms of K, Q, S and e.

The value of S (specific fluid gravity) will be a maximum of about 1.1 for a well producing salt water and a minimum value of .80 for a well producing oil. The

TABLE 1

Type of Rod String	Percent of Length 1"	7/8"	3/4"	5/8"	K Average Sucker Rod Weight/ft.
1"— 7/8"—3/4"	30	32	38	....	2.11
1"— 7/8"	30	70	....	....	2.44
7/8"— 3/4"—5/8"	....	30	30	40	1.63
7/8"— 3/4"	....	30	70	....	1.83
3/4"— 5/8"	....	....	35	65	1.32
7/8"	....	100%	....	....	2.26
3/4"	....	....	100%	....	1.64
5/8"	....	....	....	100%	1.15

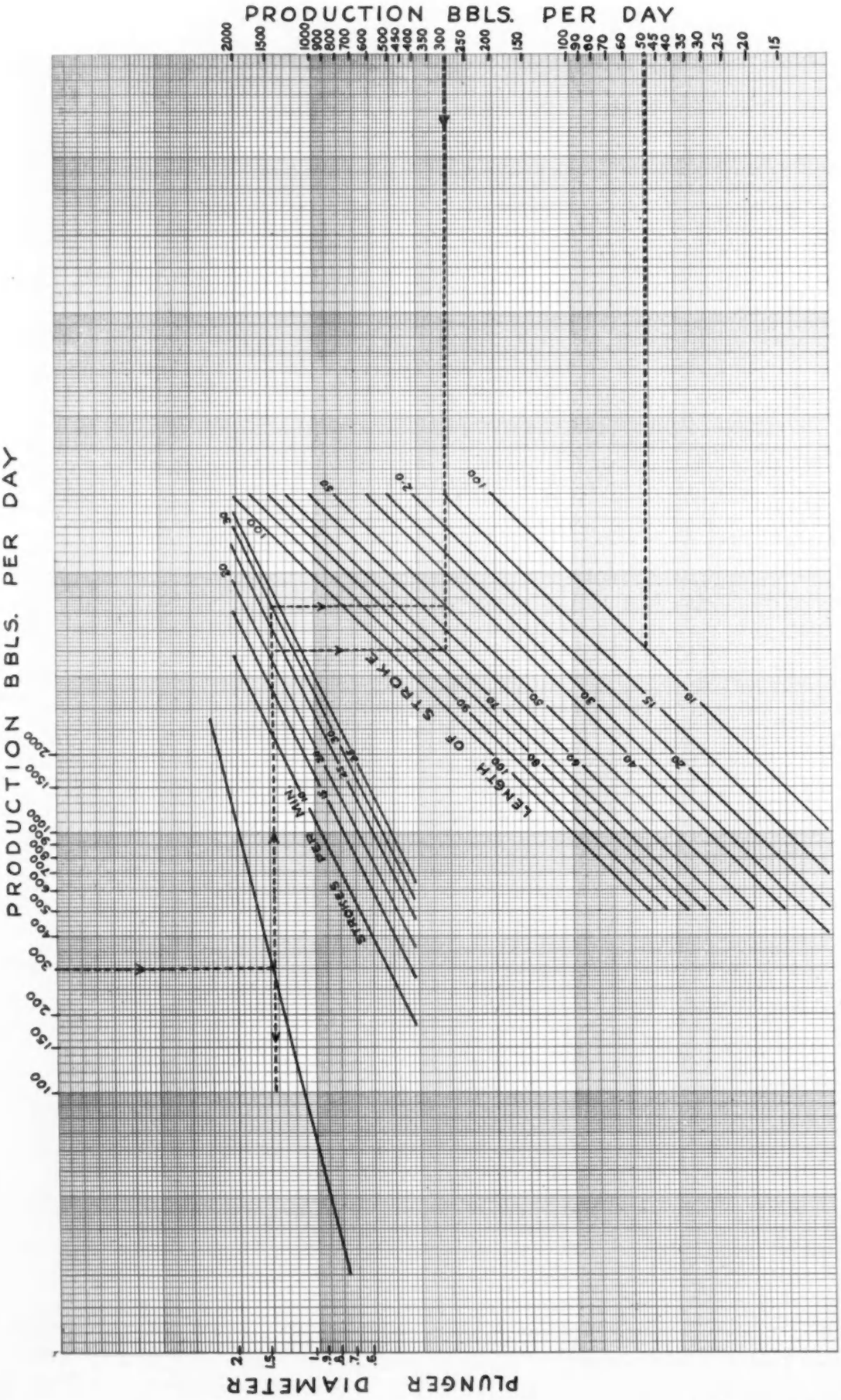


FIGURE 1
Optimum Plunger Diameter and Scale

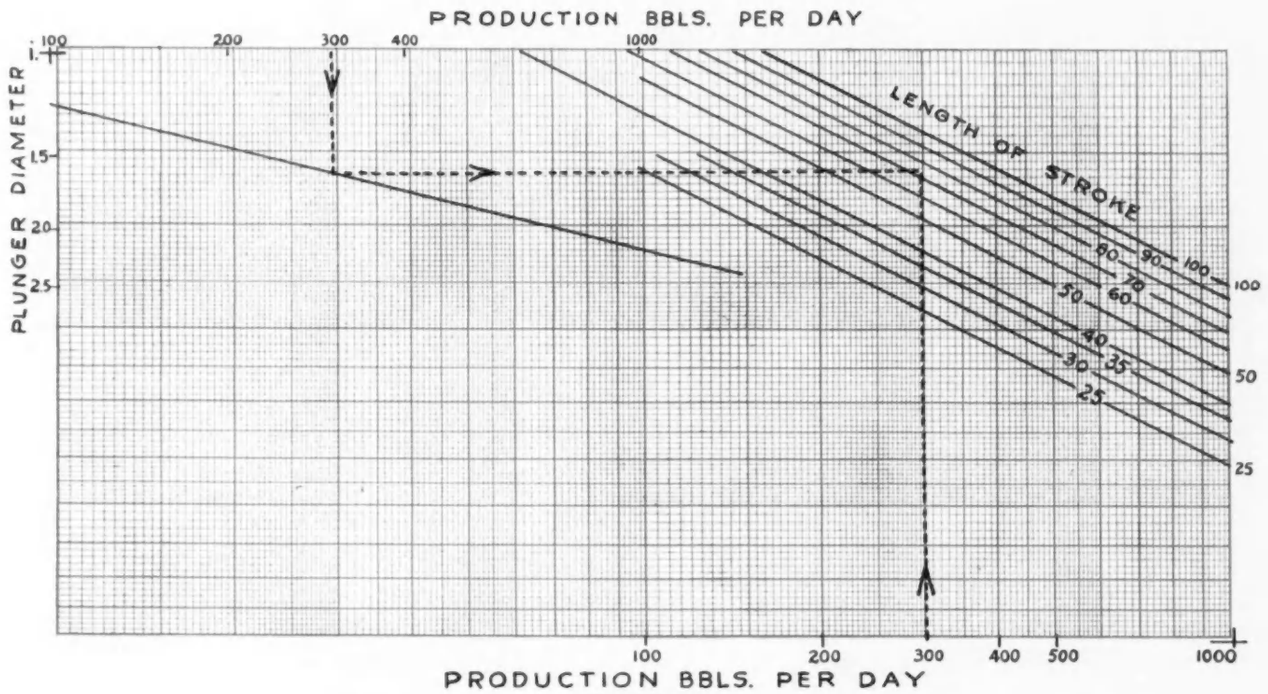


FIGURE 2

Optimum Plunger Diameter—20 Strokes Per Minute

volumetric efficiency, *e*, will vary from a value of about 50% to slightly over 100% depending on the pumping conditions. The values of *K* (average sucker rod weight per foot in tapered strings) for some sizes and proportions of rod strings are shown in Table 1.

If we let S = .85 and e = .7 or 70 percent which would probably represent a general average for normal operating conditions the equation reduces to

$$d = \left(\frac{KQ}{126}\right)^{1/4} \quad \ldots\ldots\ldots\

chart shown in Figure 1 has been constructed. To determine the optimum pumping cycle enter the chart (Figure 1) at the top at the desired production rate *(Q)* and trace down to the diagonal line. Then, read across to the left to the value of *d* (plunger diameter) as would be given by equation 9. Then trace across to the right as is indicated by the arrow to the strokes per minute at which it is desired to operate the pump. Then trace down to the length of stroke as indicated by the arrow until this line intersects a line drawn from the production *(Q)* scale shown on the right hand side of the chart. This intersection will give the length of stroke which must be used under these conditions. The dotted lines on Figure 1 show two possible combinations of speed and stroke. For example, for a production of 300 barrels per day the plunger diameter to give minimum sucker rod load will be 1.45. For a speed of 20 spm the length of stroke would be 60 inches and for a speed of 30 spm the length of stroke would be .41 inches.

If instead of the Slonneger formula we consider the one proposed by Mills [2] we have

$$P_{max} = W_o + W_R\left(1 + \frac{L\ N^2}{70{,}500}\right) \quad \ldots\ldots\ldots\ldots\ldots\ldots (10)$$

$$P_{max} = .34\ sd^2\ D + KD\left(1 + \frac{QN}{8250ed^2}\right) \quad \ldots\ldots\ldots (11)$$

Taking the derivative to find the value of *d* to give P_{max} a minimum we have

$$\frac{d\,P_{max}}{d(d)} = \left[.68S\ d + \frac{K\,Q\,N\,(-2)}{825_{oe}\,d^3}\right] D = 0 \quad \ldots\ldots (12)$$

$$d^4 = \frac{KQN}{2750es} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (13)$$

For $s = .85$ and $e = .7$

$$d = \left(\frac{KQN}{1650}\right)^{1/4} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (14)$$

It will be noted that this formula for the plunger diameter to give the minimum sucker rod load involves a speed term. The construction of a general chart for this case is not so simple as in the case of the Slonneger formula. To simplify the solution three charts for the average sucker rod string ($K = 1.82$) have been drawn. They are for $N = 20$, $N = 25$ and $N = 30$ and are shown in Figures 2, 3, and 4. In this case there is the same choice between *N* and *L*, except that the value of *N* selected will fix the *d* value, in part.

In Figure 2 we find that for a production of 300 barrels per day that a plunger size of 1.4 inches, speed of 20 spm and stroke of 74 inches is required. From Figure 4 at 30 spm a plunger diameter of 1.8 inches is required and a length of stroke of 37 inches is required.

Table 2 lists some comparative data as determined from Figures 1, 2, 3, and 4 and from formulas 1 and 10 for a 3000-foot well as indicated. This table brings out the difference in the two formulas which is reflected in the peak torque. It also shows the effect of length of stroke on the peak torque. If the maximum loads be assumed to occur when the crank is perpendicular to the pitman, the torque equation will contain as a direct factor the length of stroke. Hence, for minimum torque it can be seen that the smaller *L* is the lower the torque will be. It is, therefore, obvious that this cannot be carried to an extreme condition and that *L* will be limited by other operating conditions.

TABLE 2

For well depth D—3000 feet—K=1.82—S=.85 and e=70%
Weight of rods counterbalanced.

Fig. Used	S.P.M. N.	Length L.	Dia. of Plgr. d	Prod. Q	Max. Load P_{max}	Unbalanced Load	Peak Torque	Formula Used
No. 4	30	37	1.8	300	10,800	5400	98,000	Mills
No. 3	25	52	1.7	300	10,500	5050	130,000	Mills
No. 2	20	74	1.4	300	9,500	4000	148,000	Mills
No. 1	30	41	1.45	300	8,900	3500	72,000	Slonneger
No. 1	20	60	1.45	300	8,900	3500	105,000	Slonneger

References

[1] A. P. I. Specifications 11-E.
[2] Petroleum Engineer, April, 1939.
[3] "Factors Influencing the Application of Pumping Units," by Emory Kemler, A. P. I. Transactions, 1938.

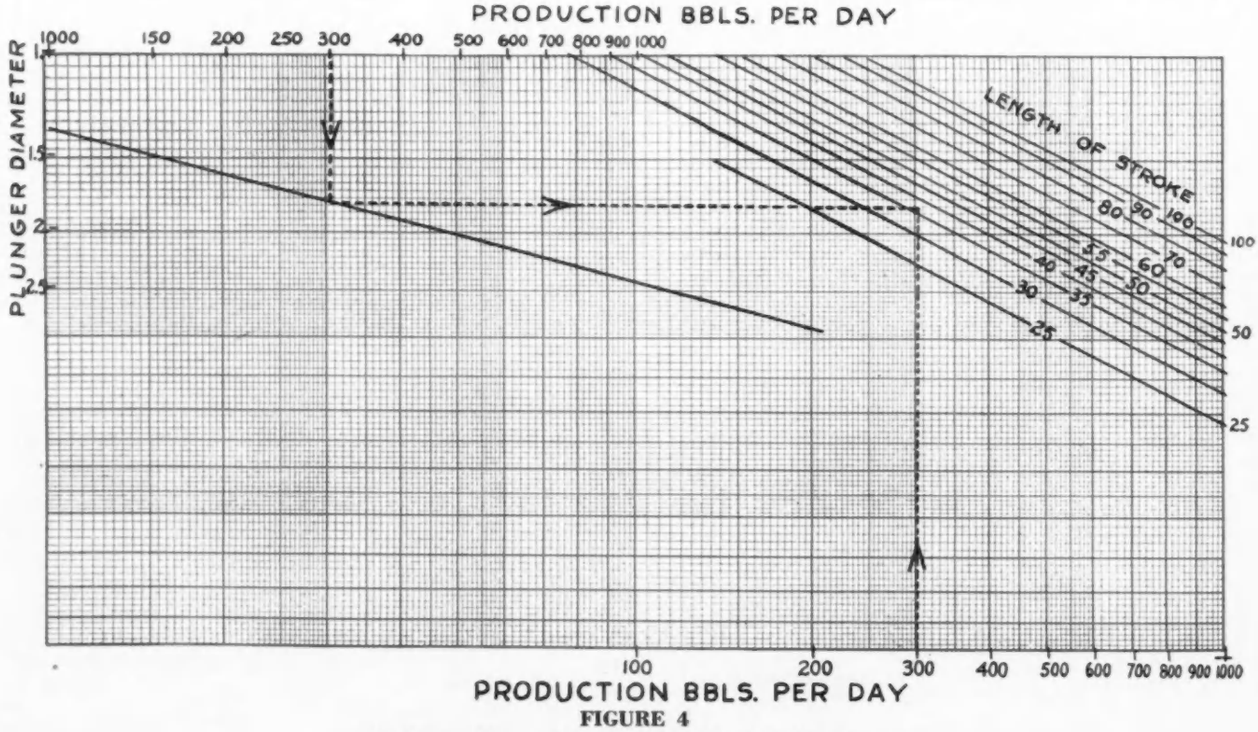


FIGURE 4

Optimum Plunger Diameter—30 Strokes Per Minute

Gel-Cements

And Their Application in Oil-Well Cementing Operations . . .

By CEDRIC WILLSON
Trinity Portland Cement Company, Houston

THIS paper discusses the behavior and properties of gel-cement slurries prior to their taking initial set, with particular emphasis on sedimentation, "viscosity" and plasticity. The properties of gel-cement and neat cement slurries after taking final set are compared and their probable effect on the result of the cementing operation discussed. Several suggested applications of gel-cement are outlined, together with recommended amounts of bentonite to be used in making up gel-cements and methods of mixing.

Cedric Willson has degrees of B.S. and C.E. from the University of Texas, and is a member of the A.I.M.E. Of twelve years' work in the design, manufacture and use of portland cement, the last four years have been largely devoted to the design of special portland cements for oil-field cementing operations and studies on their application in the field.

This paper was presented before the Mid-Continent District, American Petroleum Institute Division of Production, at Amarillo, Texas, March 21, 1941. Statements and opinions expressed are the author's, and should not be construed as an official action or opinion of the Institute, nor of this publication.

BENTONITE, or colloidal clay, was first used as an admixture with cement and water in oil-well cementing operations about 10 years ago. Since that time, it has been used periodically and to a greater or lesser extent in practically every section of the oil country as a possible solution for certain difficulties encountered in obtaining satisfactory cement jobs or in an attempt to secure satisfactory jobs at a lower cost. The results obtained have, in the opinions of various operators, ranged from very successful to unsuccessful and the use of bentonite with cement is still a controversial question. This is evident from records of cementing operations in many fields where, under the same conditions, various percentages of bentonite were used by some operators and not at all by others.

It is thought that a more thorough knowledge and understanding of the properties and behavior aid operators in determining eth-h of bentonite cement slurries will whether their use should result in more satisfactory cement jobs. The scope of this paper is a summary review of these properties as compared to neat cement slurry with a brief discussion of their application to certain phases of oil well cementing.

As a preliminary step, different methods of adding finely ground bentonite to the slurry will be considered. As would be expected, it was found a thorough dispersion in the mixing water prior to adding the cement produced a greater effect than when it was premixed dry, the ratio being about 1 to 2. In other words, to obtain certain properties in a gel-cement slurry it was necessary to premix twice as much dry bentonite with the cement as would accomplish the same result when thoroughly dispersed in the mixing water. Further investigation indicated this apparent economy could not be realized in ordinary field operations due to the incident costs of additional labor, transporting suitable tanks, etc., and that the more economical and practical method was premixing dry bentonite with the cement. This can be accomplished by adding bentonite to cement at the mixing hopper in the field or by purchasing the cement from the manufacturer with the specified percentage of bentonite mixed with it at the plant. Unless an automatic feeding device is furnished by the service company doing the cementing, it is doubtful if the specified percentage of bentonite can be maintained within reasonable limits by a field mix. Manually operated feeding devices or manual feeding to the cement hopper have not been satisfactory in general. A recent check-up of six gel-cement jobs was made where the bentonite was being added manually to the cement at the hopper. The specified amount to be added was 2 percent but the actual amount varied from a minimum of 1.06 percent to a maximum of 3.18 percent, the nearest to the specification being 2.4 percent. Further, it is difficult if not impossible to feed the bentonite uniformly. If the advantages expected from gel-cements are to be actually realized, closer control than this is necessary and the purchase of cement in which the specified amount of bentonite has been thoroughly premixed is suggested.

In the discussion which follows, the term gel-cement will designate any type of portland cement in which a stipulated percentage of finely ground bentonite has replaced that amount of cement by weight and the bentonite thoroughly and uniformly mixed with the cement.

After cement and water are mixed to form slurry, the cement immediately starts to settle out since it has approximately 3 times the density of water. The rate of sedimentation for a certain cement depends on the water-cement ratio or the volume of water with which a given amount of cement is mixed. When the volume of water is small, there is little or no free water in which the cement particles can move about. There are more col-

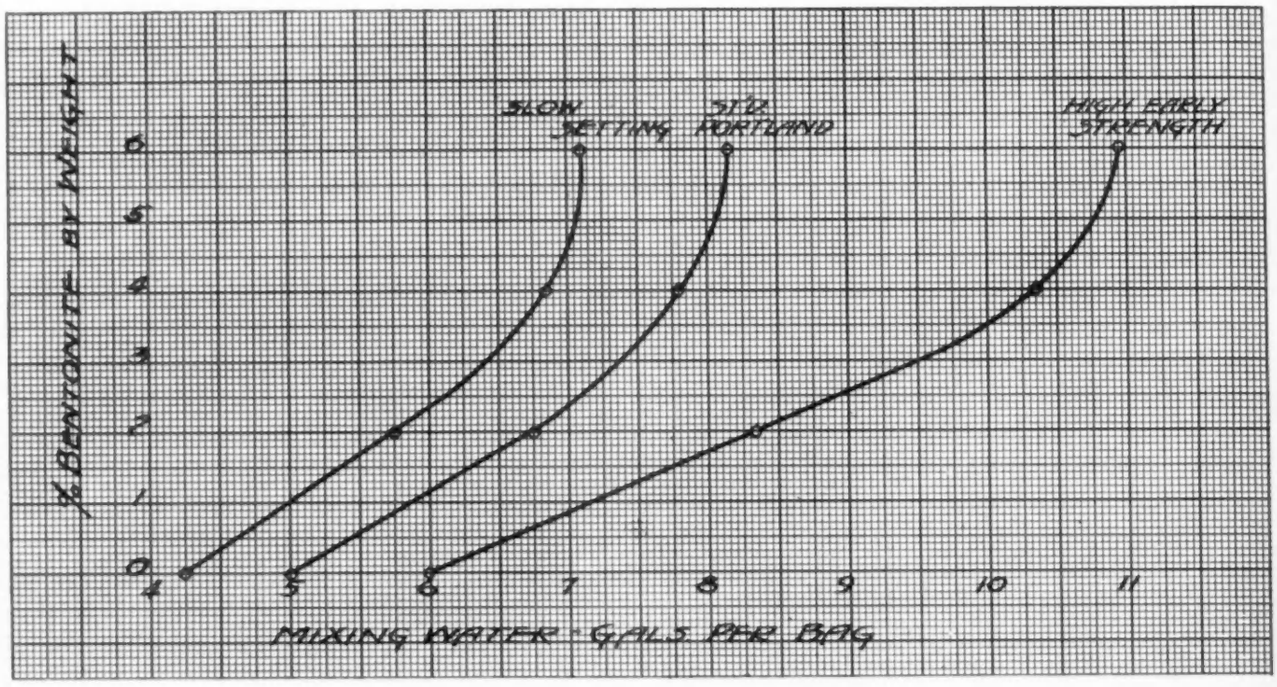


FIGURE 1

Bentonite required to eliminate sedimentation at various water-cement ratios, using average Mid-Continent oil-field cements

lisions between particles, greater internal friction, and the cement stays in suspension a longer time. *For every cement there is a water-cement ratio at which the cement stays in suspension until the initial set has taken place and the set or hardened volume of the slurry is the same as the fluid volume.* In this discussion, mixing water in excess of this amount will be termed "free water."

When the water-cement ratio is increased beyond this critical point, there is free water in which the cement particles can easily move about without colliding with each other and they fall out of suspension more or less rapidly. This may be more clearly understood by considering the sedimentation to be caused by a gravitational pull on the particles. This tendency is resisted by the viscosity of the free water flowing through spaces between particles. As these spaces become larger, due to a larger volume of water per unit of cement, the water flows through them more rapidly and the rate of sedimentation is faster.

However, if bentonite is dispersed in this same volume of water, cement mixed with it will remain in suspension for a longer period. Due to their colloidal action, the free water is now adsorbed and bound to the submicroscopic clay particles in films which may be ten or more times as thick as the particle itself, forming a gel. The gel, being more viscous than water, offers more resistance to the gravitational pull on the cement particles and its flow through the spaces between particles is slower than water. The rate of sedimentation is, therefore, retarded in proportion to the viscosity of the colloidal gel in which the cement is mixed.

We can now add a corrollary to our first statement on the relationship between water-cement ratio and sedimentation which applies particularly to slurries with water-cement ratios so high that sedimentation would normally take place before their initial set. *In slurries containing free water, there is a percentage of bentonite for every cement and water-cement ratio which will hold the cement in suspension until the initial set has taken place and the set or hardened volume is the same as the fluid volume.*

Figure 1 is a series of curves for the various types of portland cement commonly used in the oil country showing the range of water-cement ratios at which there is practically no sedimentation for neat cement, 2 percent gel-cement, 4 percent gel-cement, and 6 percent gel-cement.

It is also obvious that a given volume of cement mixed with a volume of gel will have a greater plasticity and "viscosity" than when mixed with the same volume of water, and this increase will be in proportion to the viscosity of the gel. Further, if the free water is incorporated in a colloidal gel, we can expect it to offer more resistance to being forced out of the slurry by pressure, which means the water loss from slurry under pressure will be less for gel-cement than for neat cement when it contacts permeable or porous bodies.

Thixotropy, or the ability to thicken upon standing, is a recognized property of bentonite gels and it follows that a slurry prepared by mixing cement with such a gel will also have this property.

To recapitulate, the addition of bentonite to portland cement slurry will:

1. Tend to hold cement in suspension until initial set occurs.
2. Increase its plasticity and "viscosity."
3. Reduce the loss of free water when slurry under pressure contacts porous or permeable bodies.
4. Impart a thixotropic property.

These four things are all that can be acccomplished by the use of gel-cement and any advantage it may have in oil-well cementing operations must be based on one or more of them.

The relationship between cement, water, and bentonite can be illustrated in the schematic diagram of Figure 2. A fixed quantity of cement requires a certain amount of water to form a paste of normal consistency. This is the approximate amount necessary for

IN THIS EMERGENCY

Paraphrasing an old operatic lyric—"A steelman's lot is not a happy one." When business is at low ebb, the struggle is to get enough tonnage to produce steel economically. When the tide of business swings to the other extreme, the big job we all have is to satisfy the customer who is unable to get all the steel he needs.

Believe me when I say that this is one time when the wheel that squeaks the loudest is not getting the grease. We are doing everything humanly possible to be helpful in this emergency and to be fair in the apportioning of our output—and to assist you further we are constantly setting new records in all our plants in our production of ***steel—first line of national defense.***

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It comes in long lengths that reduce the number of welds and speed construction of the line. Its perfect roundness and uniform wall thickness facilitate welding and produce better joints. Its superior physical properties make bending less of a task and provide greater strength for creek crossings and suspended lines. Finally, absolute freedom from scale inside and outside eliminates the danger of clogged valves and contamination of fluids carried.

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REPUBLIC ELECTRIC WELD
LINE PIPE—NORMALIZED CASING AND TUBING

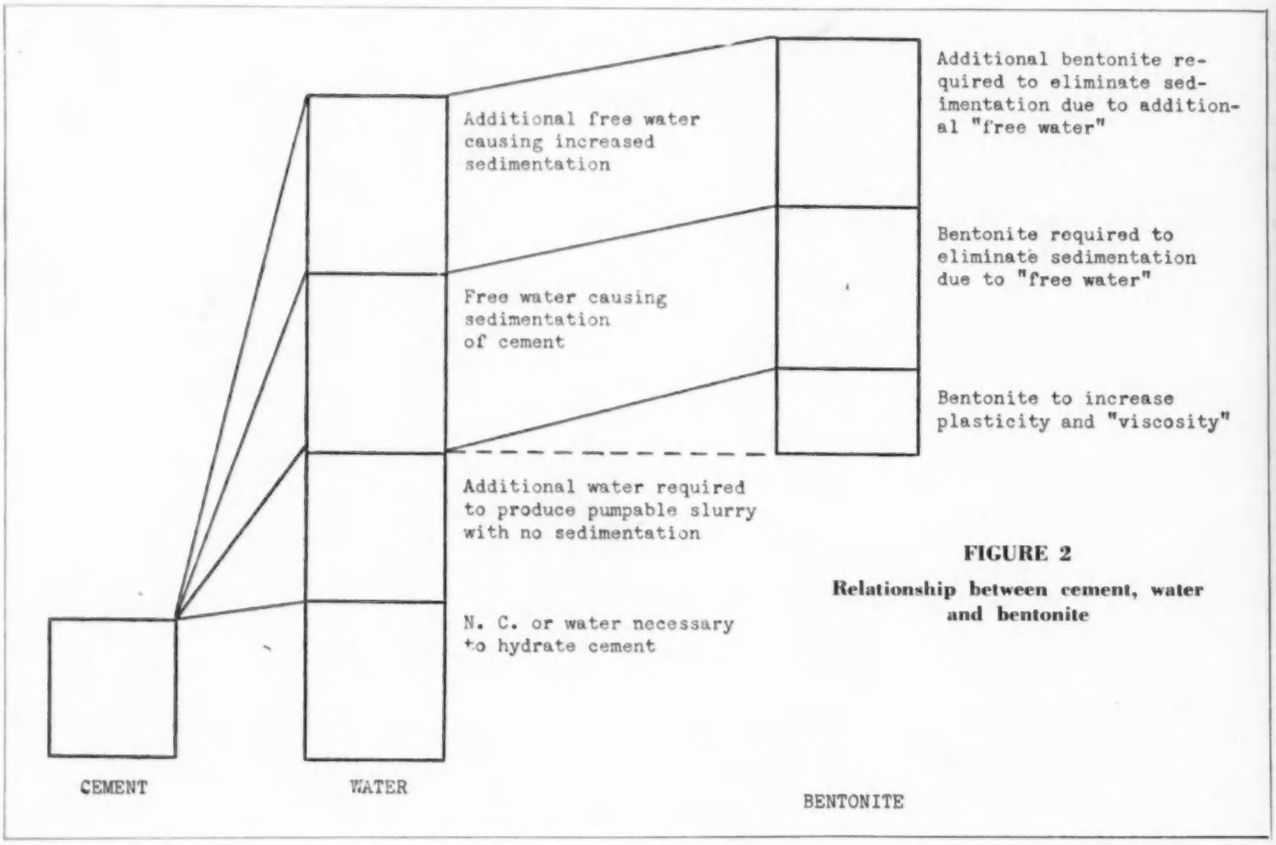

Additional free water causing increased sedimentation
Free water causing sedimentation of cement
Additional water required to produce pumpable slurry with no sedimentation
N. C. or water necessary to hydrate cement
Additional bentonite required to eliminate sedimentation due to additional "free water"
Bentonite required to eliminate sedimentation due to "free water"
Bentonite to increase plasticity and "viscosity"
CEMENT
WATER
BENTONITE

FIGURE 2

Relationship between cement, water and bentonite

complete hydration of the cement. To produce a fluid slurry, but one in which there will be no sedimentation, an additional amount of water is required. Bentonite added to this slurry will increase its plasticity and "viscosity." If still more water is added, additional amounts of bentonite in proportion will eliminate the sedimentation of cement due to this excess or free water. It should be noted that the addition of bentonite is a function of the mixing water rather than the cement.

Before considering the possible application of these changes in the physical properties of fluid cement slurry due to the addition of bentonite, other properties must be considered. Proper mechanical placement of the slurry is dependent upon its setting time and the length of its pumpable period. The success of the cement job following placement is, to a large extent, dependent on the strength and density of the set slurry. These properties of gel-cements will be compared with those of neat cements.

Setting Time

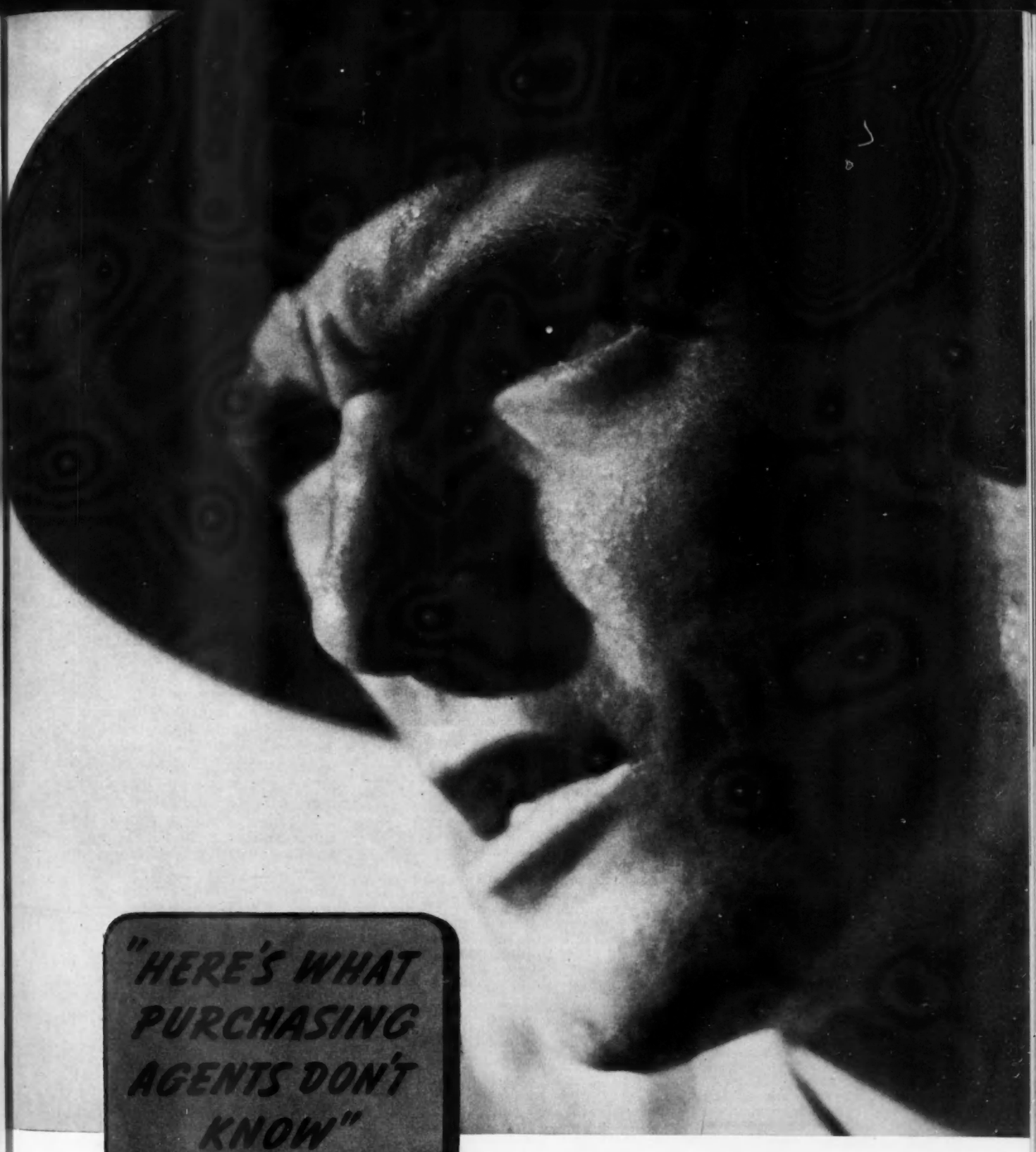
The setting time of gel-cement slurries is somewhat less than neat slurries of the same water-cement ratios or unit weights. As the percentage of bentonite increases, the setting time decreases. If not over 4 percent bentonite is added the setting time is not enough faster to cause difficulty in placement unless the bottom-hole temperature is extremely high or an unusually large amount of cement is to be placed. The addition of 2 percent bentonite to any type of portland cement will usually decrease the setting time about 5 to 8 percent and the addition of 4 percent will result in a decrease of from 10 to 15 percent. When the addition of bentonite to cement is accompanied by an increase in the water-cement ratio, the gel-cement slurry will have a longer setting time than neat slurry of the same "viscosity" or consistency. For example: A 4 percent gel-cement slurry having the same consistency as a 5-gallon-per-sack 16-pound neat slurry will have a water-cement ratio of 8.5 gallons per sack, a weight of 13.8 pounds per gallon, and the setting time will be increased by about 35 percent.

Table 1 shows a series of initial and final Gillmore needle setting times on normal consistency pats and Vicat needle initial setting times on a number of slurries using a popular oil-country standard portland cement. The relationship between cement, water, bentonite, and setting time is evident. Particular attention is called to the third group which shows the increase in setting times due to increased water-cement ratios, the slurry consistencies being held constant by adding increasing percentages of bentonite.

Pumpable Time

As with setting time, if the water-cement ratio is maintained, the addition of bentonite will decrease the pumpable time somewhat although not enough to affect placement on the ordinary job if the gel-cement does not exceed 4 percent. At this percentage, the pumpable time is usually decreased from 15 to 20 percent which is within the factor of safety of pumpable time on most cementing operations. However, under certain conditions, it may be necessary to give consideration to this decrease in planning the job. If additional mixing water is added with the bentonite, the pumpable time will be increased as compared to neat slurry having the same consistency.

The water-cement ratio law—strength is governed by the quantity of mixing water used per sack of cement—is very important in



"HERE'S WHAT PURCHASING AGENTS DON'T KNOW"

Purchasing agents know what everything costs when they buy it, but they can't always know what it costs to operate it after it's installed. There aren't many purchasing agents today who have ever rolled out of bed at 3:00 in the morning in a blinding storm and tried to fish a string of parted rods out of the hole. There aren't many purchasing agents today who have been splashed with crude oil from head to foot by three pump jobs in 48 hours. If there were they would never use any pumping equipment besides Axelsons. What purchasing agents don't know is what keeps me on my job, doubles my work. So why should I kick.

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THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

TABLE 1

Setting Time Comparison

Gillmore Needle Setting Times on N. C. Pats—Standard Portland Cement at 70° F.

Percent Bentonite bu Weight	Initial Setting Time	Final Setting Time
None	2 hrs. 15 mins.	4 hrs. 35 mins.
2 percent	2 hrs. 10 mins.	4 hrs. 15 mins.
3 percent	2 hrs. 00 mins.	4 hrs. 00 mins.
4 percent	1 hr. 55 mins.	3 hrs. 50 mins.

Vicat Needle Setting Time—16 Lb. Per Gallon Standard Portland Cement Slurry at 70° F.

Weight in Lbs. per Gallon	Gals. Mixing Water per Bag of Cement	Percent Bentonite by Weight	Initial Vicat Nee le Setting Time
16.0	5.0	None	4 hrs. 10 mins.
16.0	5.0	2 percent	3 hrs. 45 mins.
16.0	5.0	3 percent	3 hrs. 25 mins.
16.0	5.0	4 percent	3 hrs. 15 mins.

Vicat Needle Setting Time—Standard Portland Cement Slurries of Equal Consistency at 70° F.

Weight in Lbs. per Gallon	Gals. Mixing Water per Bag of Cement	Percent Bentonite by Weight	Initial Vicat Needle Setting Time
16.0	5.0	None	4 hrs. 10 mins.
15.2	6.0	2 percent	3 hrs. 55 mins.
14.6	7.0	3 percent	4 hrs. 35 mins.
13.8	8.5	4 percent	5 hrs. 50 mins.

the consideration of gel-cements and their use. For a given amount of cement, the strength of the set slurry will decrease as the quantity of mixing water is increased and the addition of bentonite will have no direct effect on this fundamental relationship between the water-cement ratio and strength of the hardened slurry.

Permeability

Although complete data on the permeability of cement slurries are not available all test results have shown that strength and density are closely related. This means that a low water-cement ratio slurry has low permeability and high water-cement ratio slurry will be porous and permeable. The addition of bentonite to the slurry will not directly affect this relationship.

To summarize, the addition of bentonite to cement-water slurry will:

1. Hold cement in suspension in slurries where the water-cement ratio is so high it would otherwise settle out of the mixing water before the initial set occurs.
2. Increase the plasticity and "viscosity" of a slurry of fixed water-cement ratio in proportion to the amount of bentonite added.
3. Reduce the loss of free water from slurry under pressure which contacts porous or permeable bodies.
4. Impart the characteristic thixotropy of bentonitic gels to the slurry.
5. Decrease the setting time and pumpable time by a small percentage.
6. Increase the setting time and pumpable time as compared to a neat cement slurry of the same consistency.
7. Have no effect on strength of the water-cement ratio law which controls strength.
8. Have no direct effect on permeability.

The principal purposes of primary oil-well cementing are:

1. To provide a "shut off," that is, to confine the gas, oil, and water to their respective formations.
2. To reinforce and support the casing and permit it to be set at any desired depth without regard to the depth of the well.
3. To eliminate the hydrostatic head behind the casing by filling the annular space with a hard dense mass.
4. To prevent movement of the casing after it has been placed in position.
5. To prevent corrosion of the casing.
6. To protect shallow oil- and gas-bearing formations so they may be produced when deeper formations have been exhausted.

In order to justify the use of gel-cement, it must be established that its use will accomplish one or more of these purposes either better or more economically than neat cement. In the light of our knowledge of the properties of gel-cement, its application to these objectives may now be investigated.

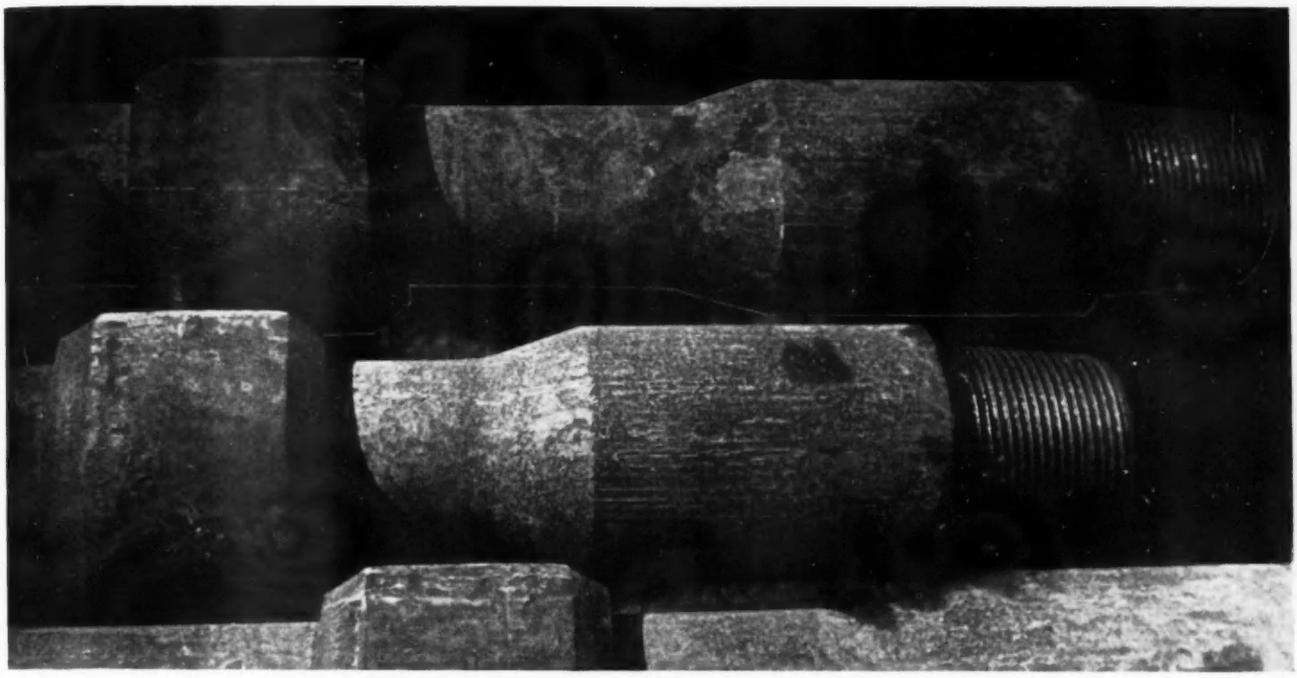
A general consideration indicates that a continuous body of uniform homogeneous set slurry is necessary for a successful job. Water pockets and alternate sections of high permeability and low strength are obviously undesirable. To eliminate them, it is essential for the cement to stay in suspension until it has set. As previously stated, there is a water-cement ratio for every cement at which it will stay in suspension and a percentage of bentonite for any higher water-cement ratio which will also cause the cement to remain in suspension. This can be illustrated by tabulating the properties of three slurries mixed with an average oil-country standard portland cement.

Each of the slurries in Table 2 should set in a uniform continuous body without sedimentation, this being accomplished by using a 2 percent gel-cement for the 14.7-pound slurry and a 4 percent gel-cement for the 14.0-pound slurry as indicated in Figure 1. There is a gain in yield of 0.23 cubic feet per bag or 20 percent by using 14.7-pound slurry and a gain of 0.4 cubic feet per bag or 35 percent using 14.0-pound slurry. The operation of the water-cement ratio law should here be noted. The increased water-cement ratios have resulted in lower strengths which are accompanied by higher permeabilities. To illustrate an application of this data: In planning a cementing operation we will assume the operator does not believe the strength and low permeability developed by 5-gallon-per-bag neat slurry as shown in Table 2 is necessary for a successful job. In this case, a selection of the strength desired will indicate some higher water-cement ratio which, Figure 1 shows, will result in free water. After this slurry is in place, settling out of cement can be expected. In this instance, it would certainly seem advisable to replace neat cement with the proper percentage gel-cement which will insure little or no sedimentation, that is, a slurry in which the set volume will practically equal the fluid volume. This can be obtained from Figure 1 after determining the water-cement ratio necessary to develop the selected strength. The tabular comparison in Table 2 also brings out the question of a gain in volume from the use of gel-cement. It has been said that gel-cement produces a greater volume of slurry than neat cement. This is not true from a practical standpoint although there is a slight in-

TABLE 2

Properties of Three Slurries

Bentonite by Weight	Water-Cement Ratio Gallons per Bag	Weight per Gallon	Yield in Cu. Ft. per Bag	72 Hour Compressive Strength @ 100° F.
None	5.00	16.0 lbs.	1.15	6000 p. s. i.
2 percent	6.75	14.7 lbs.	1.38	2900 p. s. i.
4 percent	8.00	14.0 lbs.	1.55	1200 p. s. i.



These PATTERSON-BALLLAGH *Protectors good for* 100,000 *feet of hole*

Five Texas wells, each more than 11,000 feet deep, were drilled with the Protectors shown in these unretouched photos. The Protectors are still in prime condition and show no loss in diameter. The Drillers estimate they are good for at least five or six more wells — a total of more than 100,000 feet of hole. That's a lot of hole — and a lot of service from one string of Protectors. Only the toughest kind of rubber can render such service. Patterson-Ballagh rubber can take punishment! It's compounded by exclusive Patterson-Ballagh methods.

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crease due to bulking of the wetted bentonite.

The volume of slurry produced from a sack of cement depends entirely on the volume of mixing water per bag. Referring again to Table 2, the gain in volume of the 14-pound over the 16-pound slurry of 0.4 cubic feet per bag is due to increasing the mixing water from 5 gallons to 8 gallons. Three gallons of water have a volume of 0.4 cubic feet and this gain in volume per bag could be realized by simply increasing the water-cement ratio by this amount regardless of the presence or absence of bentonite. However, as we have seen, this would result in 3 gallons of free water per bag of cement. After the slurry was in place, sedimentation could be expected and a continuous uniform body of cement would probably not be obtained. The purpose of bentonite in this particular slurry is not to increase the volume but to maintain a uniform cement body following placement. However, it should be realized that the gain in volume, which is accomplished by adding additional mixing water, carries with it proportionally lower strengths and higher permeabilities in accordance with the water-cement ratio law even though the use of gel-cement provides a uniform homogeneous set slurry.

To accomplish the objectives of primary cementing, it is also necessary to eliminate channeling and effect thorough displacement of drilling fluids by cement slurry, particularly around the casing shoe. There is considerable evidence to show that a viscous slurry pumped out rapidly will provide a plug-like flow which will aid in obtaining complete mud displacement. Replacing neat cement with gel-cement at a fixed water-cement ratio not only increases the "viscosity" but also imparts an increased plasticity or buttery internal cohesion to the slurry which should aid in getting plug-like flow at high velocities.

There is also evidence that rotation of the casing while mud is being displaced by slurry will tend to eliminate channeling and this is being done by a number of operators. This practice utilizes the friction between the pipe and the slurry, rotation tending to force the latter to travel in a spiral as it moves up the annulus. The efficiency of this method depends on the friction between slurry and casing which in turn depends on plasticity. The plasticity of a fixed water-cement ratio slurry can be increased by replacing neat cement with gel-cement.

Both of these applications depend for their success on maintaining the water-cement ratio and building up "viscosity" or plasticity by the use of gel-cement. If the water-cement ratio is increased along with the addition of bentonite, any advantage which might be gained from its use is lost and the only result will be a set slurry having lower strength and higher permeability.

It is sometimes difficult to obtain the desired fill up behind pipe where sections of the slurry column are in contact with porous or permeable formations. This is probably due to a decrease in volume on account of water loss from the slurry to formation. At a given pressure, there will be less water lost to a permeable formation from a gel-cement slurry than from a neat cement slurry having the same water-cement ratio and a more satisfactory fill up under these conditions should be accomplished by the proper use of bentonite. Here again, in order to realize the expected advantage from gel-cement as compared to neat cement slurry, it is necessary to maintain the water-cement ratio.

When it is necessary to place cement in a small annular space as between two strings of pipe, the use of the proper type of slow-setting cement should result in placement with lower pump pressures. Some of these special cements have extremely low "viscosities" at comparatively low water-cement ratios and, consequently, high strength and low permeability can be realized from a very fluid slurry. These cements have a slower setting time than other types which aggravates the problem of sedimentation following placement, particularly at shallow depths and low temperatures such as would usually be encountered in the Mid-Continent. In this instance, sedimentation could be eliminated by the use of gel-cement. The low "viscosity" will reduce pipe or wall friction and thereby reduce the pressure required to land the slurry while bentonite will hold the cement in suspension to insure a uniform cement body.

In squeezing or plugging back wells to exclude salt water it has been difficult in some areas to build up sufficient pressures to obtain satisfactory jobs. In these instances the thixotropic property of gel-cements has, many times, overcome this difficulty. The most successful practice has been to pump the last 20 to 30 bags out of the tubing in stages of 5 or 6 bags, allowing a 5-minute shutdown between stages. The thixotropy of the gel-cement slurry causes an increased resistance to the passage of slurry through the porous water sand following the shutdown and after a few stages, usually not more than 3 or 4, the desired pressure is obtained.

The proper percentage of bentonite to specify for the makeup of gel-cement depends on the purpose for which it is used. When it is desired to prevent sedimentation in a high water-cement ratio slurry, strength tests indicate that 4 percent is probably the upper safe limit. With a greater percentage of bentonite, the water-cement ratio is so high that strengths are dangerously low and the slurry is undoubtedly very permeable. The best method would seem to be a selection of the strength desired which will automatically set the percentage of bentonite required to eliminate sedimentation for that particular water-cement ratio. When it is desired to build up the "viscosity" or plasticity of a certain water-cement ratio slurry, the percentage of bentonite will be limited by the decrease in pumpability and setting time. Ordinarily a 2 percent gel-cement will provide as plastic a slurry as the pumps will handle and, with a low water cement ratio, the limit may be reached with 1 percent or 1.5 percent bentonite.

No attempt has been made to cover all the possible aplications of gel-cement. The few discussed served mainly to illustrate what is thought to be a more logical and perhaps scientific approach to the question than many operators are now practicing, and one which, it is believed, should result in more satisfactory cement jobs.

The author wishes to express his gratitude to the Trinity Portland Cement Company for permission to present this paper and to G. C. MacDonald, Z. Z. Hunter, T. L. Reagan, and W. A. Van Hook for suggestions and constructive criticisms.

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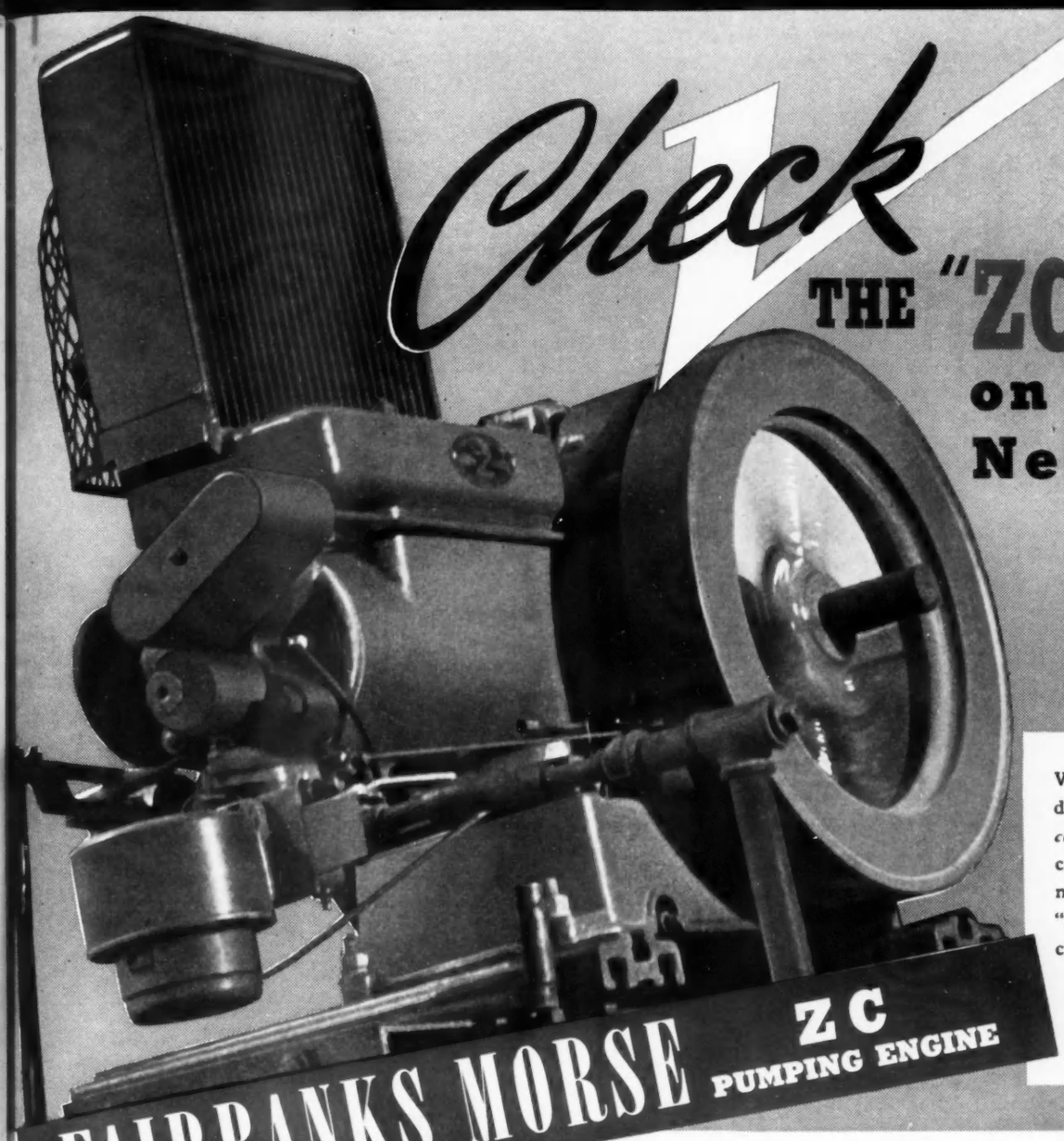

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A. P. I. Casing List Reduces Number of Sizes

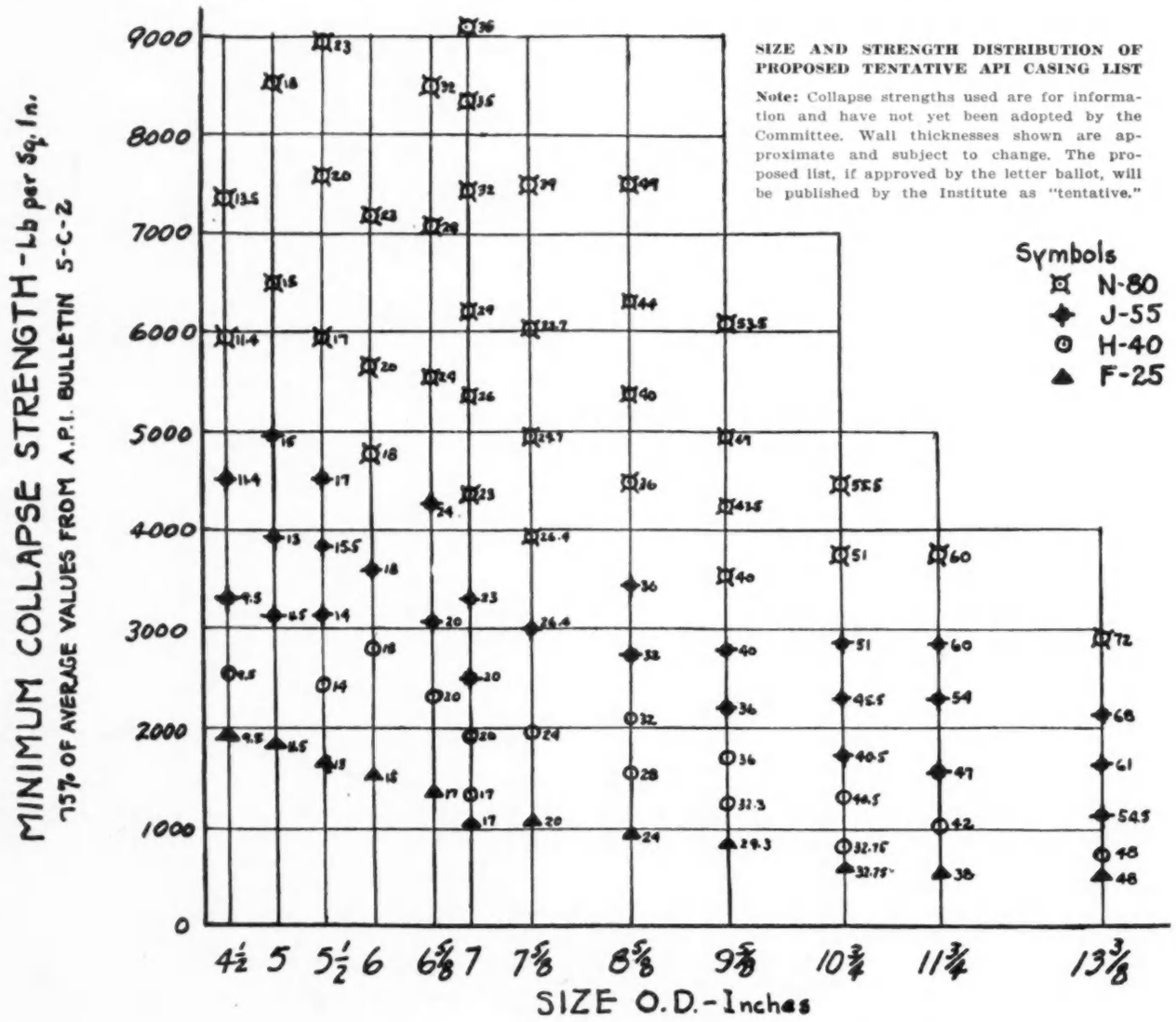
PROPOSED adoption as tentative of a new casing list, designed to reduce the number of sizes, weights and grades of casing to around 90 from more than 200, has been recommended at the Chicago meeting last month by the American Petroleum Institute, through its Division of Production Committee on Standardization of Oil Country Tubular Goods subject to letter ballot. This simplification program is the continuation of API work started last year, with ultimate elimination of various overlapping casing sizes that tend to increase casing costs being the objective. Since the Chicago meeting a few changes have been made, the last as included for ballot, being shown below.

A detailed report of the committee work at the Chicago meeting in November was published in THE OIL WEEKLY of December 9, 1940. The tentative simplified list proposed at that meeting included 86 items in the 4½-13⅜-inch range, as against 89 times in the revised tentative list.

Although recent efforts toward simplification has been centered on the popular size range, 16- and 20-inch sizes will be included in the finished schedule. A check of casing sizes used during the past few years revealed that almost 250 different items had been included. The proposed casing list is intended to include all casing that may be required to drill oil and gas wells to any depth, with emphasis on simplification.

The large number of weights and strengths available in the past frequently has given the user the option of selecting two, and occasionally three, comparable items of the same diameter. The simplified list takes into consideration all of these overlapping factors, and attempts to establish the smallest number of items meeting casing requirements.

Members of the subcommittee include H. N. Marsh, General Petroleum Corporation, chairman; C. A. Dunlop, Humble Oil and Refining Company; J. Jay Dunn, National Tube Company; W. M. Frame, Spang Chalfant Division, The National Supply Company; H. W. Ladd, Stanolind Oil & Gas Company; M. A. Sherwood, Shell Oil Company; J. C. Siegle, Youngstown Sheet and Tube Company, and Thomas G. Stitt, Pittsburgh Steel Company.



SIZE AND STRENGTH DISTRIBUTION OF PROPOSED TENTATIVE API CASING LIST

Note: Collapse strengths used are for information and have not yet been adopted by the Committee. Wall thicknesses shown are approximate and subject to change. The proposed list, if approved by the letter ballot, will be published by the Institute as "tentative."

Stronger Oil Markets Reflect Improved Situation

By L. J. LOGAN, Associate Editor

FAVORABLE circumstances continue to surround the petroleum industry, and increasingly desirable operating results appear to be in store for the oil companies.

Prices of virtually all petroleum products have improved materially within the past month and still are gaining ground, and the advances have fairly well compensated refiners for the higher costs of crude, following the increase of crude postings around April 1.

Producers, in turn, through the revision of postings, have been compensated for their increasing costs of operation.

Gasoline has participated prominently in the broad advance of the markets, the average tank-car price of regular grade being now a little over ½ cent a gallon better than in the early part of this year, when gradual recovery commenced. The wholesale price now is within about ¼ cent of the average that prevailed at this time last year, and whereas the markets a year ago were weakening, they now are growing stronger.

Gasoline prices have shown noteworthy improvement not only at the refineries and in the jobber market, but also at the service stations, the betterment having been more pronounced, in fact, at the retail outlets than in the wholesale markets. The average dealer-tank-wagon price of regular grade currently is approximately ¾ cent a gallon better than in the early part of the year.

Lubricants have improved significantly. Since the beginning of the year, bright stocks have advanced at Western Pennsylvania refineries 4 cents a gallon, and neutrals have increased 3 cents. The lubricants suffered considerably when exports to Europe were greatly reduced by the war, inventories having accumulated and prices having declined. And it was not until after the commencement of this year that expansion of domestic consumption began to fairly well compensate for the loss of foreign business.

Other products also have improved in price, along with gasoline and lubricants. Kerosene is now quoted ⅛ to ⅜ cent a gallon higher than in January at Mid-Continent refineries.

Light fuel oils are holding up well in price, despite the advanced stage of the season for heating, quotations being generally the same as in January or ⅛ cent a gallon lower.

Markets for heavy fuel oils continue firm, and prices are generally about the same as at the beginning of this year.

Natural gasoline, like refined gasoline, is ½ cent a gallon higher now than in January.

Crude Gains Firm

These gains that have been made in the markets for refined products, plus the prospect of additional improvement, assure firm markets for crude oil at the present higher prices, unless the situation is impaired by unwarranted expansion of crude production and refinery runs.

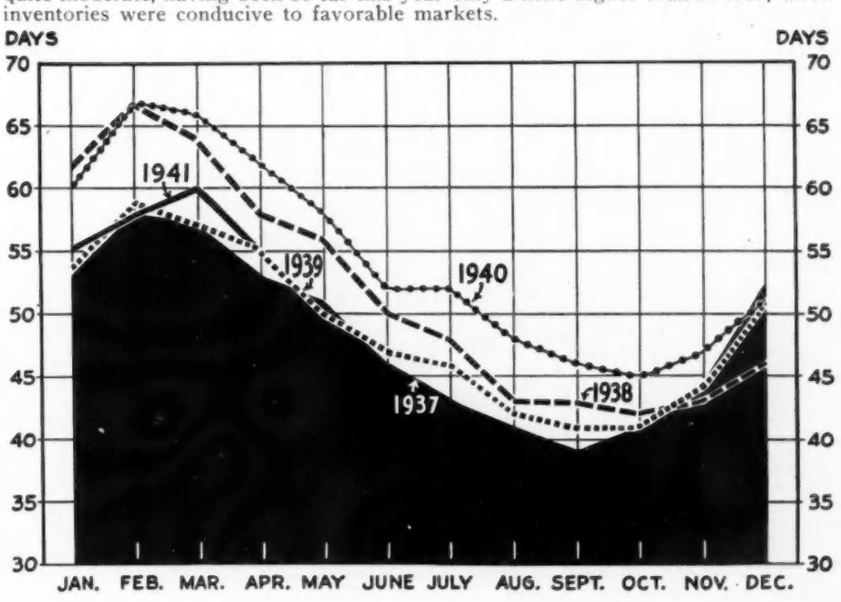
The revisions of crude postings around April 1 averaged 6 to 7 cents a barrel and affected the whole Mid-Continent and Middle-Western producing regions. And it is indicated that the increases will be not only maintained but also possibly augmented within a few weeks by further upward revisions, particularly if the gasoline market continues to improve.

Constituting the foundation for the present strong markets for refined oils and crude oil is the remarkably large demand for petroleum products. Domestic consumption has been breaking all previous records, and despite the continued relatively small volumes of export business, total demand has been greater than ever before.

Evidence of continued large demand was reflected in the latest monthly forecast of the Bureau of Mines. The bureau estimated that the domestic demand for motor

Days' Supply of Gasoline in Storage at Beginning of Month

In terms of days' supply at prevailing rates of consumption, gasoline stocks are quite moderate, having been so far this year only a little higher than in 1937, when inventories were conducive to favorable markets.

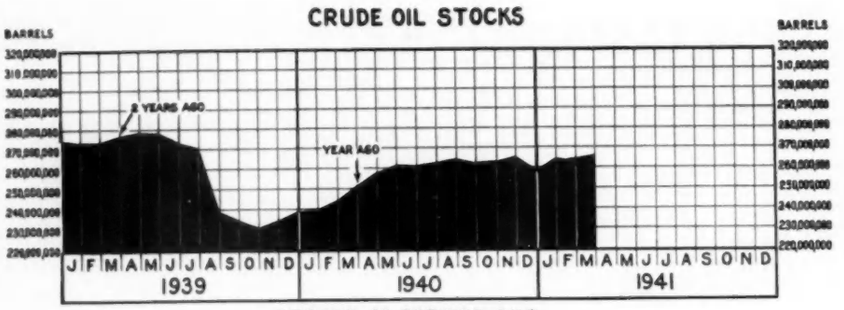


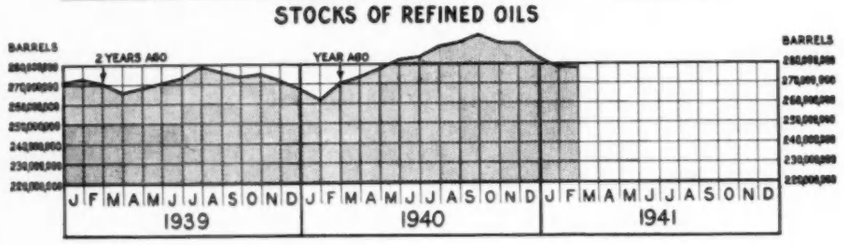
fuel in May would be 58,500,000 barrels, an increase of 10.5 percent over the actual demand in May, 1940, although exports for May, 1941, were expected to be relatively low, at 1,700,000 barrels, as compared with 1,900,000 barrels similarly estimated for April.

Gasoline demand has been consistently large all this year, and inasmuch as that product constitutes over 40 percent of the output of the refineries, it has importantly affected the trend of total demand for petroleum.

In January, total demand for gasoline was 11.1 percent larger than in January, 1940, with domestic consumption up 12.3 percent and exports down 10.1 percent. In February, the total requirements were up 14.2 percent, on a daily average basis, as domestic use showed a 16.5 percent gain, while exports were off 26.8 percent.

Figures are not yet available from the Bureau of Mines on demand in March and April. But statistics on gasoline stocks and production have indicated continuation of demand along the favorable trend of the first two months of the year. Actually, demand probably has somewhat exceeded the relatively optimistic forecasts of the Bureau of Mines.





Strong Demand for Petroleum Prevails

Figures indicate barrels, and are from Bureau of Mines

	FEBRUARY			FIRST TWO MONTHS		
	1940	1941	Percent Change	1940	1941	Percent Change
SUMMARY—						
Total Demand	107,105,000	112,760,000	+ 5.3	233,824,000	239,512,000	+ 2.4
Daily Average	3,693,000	4,027,000	+ 9.0	3,897,000	4,060,000	+ 4.2
Exports:						
Crude Petroleum	3,327,000	1,342,000	— 60.0	7,529,000	3,029,000	— 60.0
Refined Products	5,765,000	4,190,000	— 27.3	12,491,000	9,721,000	— 22.2
Total Exports	9,092,000	5,532,000	— 39.2	20,020,000	12,750,000	— 36.3
Domestic Demand:						
Total Domestic Demand	98,013,000	107,228,000	+ 9.4	213,804,000	226,762,000	+ 6.1
Daily Average	3,380,000	3,830,000	+ 13.3	3,563,000	3,843,000	+ 7.9
TOTAL DEMAND FOR PRODUCTS—						
Motor Fuel:						
Domestic	37,557,000	42,253,000	+ 12.5	77,927,000	87,597,000	+ 12.4
Exports	1,903,000	1,365,000*	— 28.3	4,177,000	3,410,000	— 18.4
Total	39,460,000	43,618,000	+ 10.5	82,104,000	91,007,000	+ 10.8
Aviation Gasoline:						
Domestic	397,000	483,000	+ 21.7	901,000	1,046,000	+ 16.1
Exports	279,000	355,000†	+ 27.2	457,000	795,000	+ 74.0
Total	671,000	838,000	+ 24.9	1,358,000	1,841,000	+ 35.6
Kerosene:						
Domestic	6,263,000	6,484,000	+ 3.5	13,905,000	14,253,000	+ 2.5
Exports	298,000	82,000	— 72.6	689,000	174,000	— 74.7
Total	6,561,000	6,566,000	+ 0.1	14,594,000	14,427,000	— 1.1
Gas Oil and Distillate Fuels						
Domestic‡	17,623,000	17,720,000	+ 0.6	40,085,000	38,718,000	— 3.4
Exports	1,234,000	791,000	— 37.0	2,783,000	2,386,000	— 14.3
Total	18,857,000	18,511,000	— 1.8	42,868,000	41,104,000	— 4.1
Residual Fuel Oils:						
Domestic	27,123,000	30,917,000	+ 14.0	59,596,000	64,255,000	+ 7.8
Exports	769,000	975,000	+ 26.8	1,908,000	1,977,000	+ 3.6
Total	27,892,000	31,892,000	+ 14.3	61,504,000	66,232,000	+ 7.7
Lubricants:						
Domestic	1,522,000	1,798,000§	+ 18.1	3,576,000	4,165,000	+ 16.5
Exports	1,089,000	744,000	— 31.7	2,157,000	1,278,000	— 40.8
Total	2,611,000	2,542,000	— 2.6	5,733,000	5,443,000	— 5.1
Wax (thousands of pounds)						
Domestic	17,028	30,837	+ 81.1	52,215	68,561	+ 31.3
Exports	28,267	10,950	— 61.3	49,409	24,179	— 51.1
Total	45,295	41,787	— 7.7	101,624	92,740	— 8.7
Coke (short tons):						
Domestic	125,700	118,600	— 5.7	263,500	314,100	+ 19.2
Exports	5,500	15,000	+172.7	22,100	26,300	+ 19.0
Total	131,200	133,600	+ 1.8	285,600	340,400	+ 19.2
Asphalt (short tons):						
Domestic	143,300	231,800	+ 61.8	292,800	438,300	+ 49.7
Exports	24,100	13,400	— 44.4	43,400	35,300	— 18.7
Total	167,400	245,200	+ 46.5	336,200	473,600	+ 40.9
Road Oil:						
Domestic	68,000	64,000	— 5.9	200,000	189,000	— 5.5
Miscellaneous:						
Domestic	35,000	232,000	+562.9	275,000	474,000	+ 72.4
Exports	211,000	45,000	— 78.7	251,000	84,000	— 66.5
Total	246,000	277,000	+ 12.6	526,000	558,000	+ 6.1

* Includes benzol—23,000 barrels. † Includes 63,000 barrels anti-knock compounds. ‡ Foreign bunker oil, 1941—Jan. 672,000 barrels Diesel; 1,315,000 barrels residual; Feb. 1,016,000 barrels Diesel, 1,272,000 barrels residual. § Includes 1,000 barrels imported for domestic use.

Stock Situation Improved

By virtue of the large demand for gasoline, stocks of that product have been brought gradually into much more favorable relation to the market requirements than they were in 1940, and the better inventory situation has made possible the improvement of prices this year.

On April 1, 1941, gasoline stocks represented only about 55 days' supply at the rate of demand indicated for the month, whereas the stocks of April 1 last year represented 62 days' supply. The present inventory in terms of days' supply is about the same as that on hand at this season in 1937, which was for the oil industry an especially profitable year.

Total stocks of gasoline on April 19, 1941, amounted to 97,899,000 barrels, nearly 6,000,000 barrels, or 5.5 percent, less than the 103,622,000 barrels on hand a year previously. Furthermore, nearly 2,000,000 barrels more of aviation gasoline is included now than a year ago in the totals given. Consequently, the indicated inventory of ordinary gasoline as of April 19, 1941, was only 91,060,000 barrels, as compared with 98,588,000 barrels in storage April 19, 1940, a decrease since a year ago of 7,528,000 barrels, or 7.6 percent. In the face of this decrease, as previously mentioned, demand for gasoline is up around 10 percent, and consequently, as shown, the present inventory represents considerably

fewer days' supply than did that on hand a year ago.

Under the dominant influence of the trend of gasoline demand, the total demand for all oils, on a daily average basis, was 9 percent larger in February, 1941, than in February, 1940, with domestic consumption up 13.3 percent, while lower exports partially offset that gain.

February results were relatively better, however, than those of January, and for the first two months of this year, total demand, on a daily average basis, was up 4.2 percent, while domestic demand showed a 7.9 percent increase.

Residual fuel oil is in particularly good demand, in reflection of the large use currently by the railroads, shipping lines, factories, mills, mines, smelters, and electric power plants, as the national defense program proceeds. Total demand for those heavy oils was 14.3 percent larger in the 28 days of February, 1941, than in the 29 days of February, 1940, with exports as well as domestic use greater. In January, domestic consumption was up about 3 percent, but exports were not as large as a year previously. Stocks of residual fuel oil on April 19, 1941, at 95,636,000 barrels, were 7,000,000 barrels, or nearly 7 percent, smaller than a year previously, when they totaled 102,603,000 barrels.

Lubricants are being used in increasing volume in the United States, and the expansion of domestic consumption has almost compensated for the loss of large export markets since the war began. In the 28 days of February, 1941, domestic demand for lubricants was 18 percent greater than in the 29 days of February, 1940. But exports were one third lower, and total demand showed a 2.6 percent decrease. These figures indicated improvement over those for January.

Because of milder weather the past winter than the one before, demand for light fuel oil has been slightly smaller this year than last year. Domestic consumption of gas oil and distillate fuel was slightly larger in the 28 days of February, 1941, than in the 29 days of February, 1940, but exports were smaller, and there was a decrease of 1.8 percent in total demand. Stocks of the light oils are about 4,000,000 barrels (17 percent) larger than a year ago, having totaled 28,410,000 barrels April 19, but that increase is justified by the prospect of increased demand.

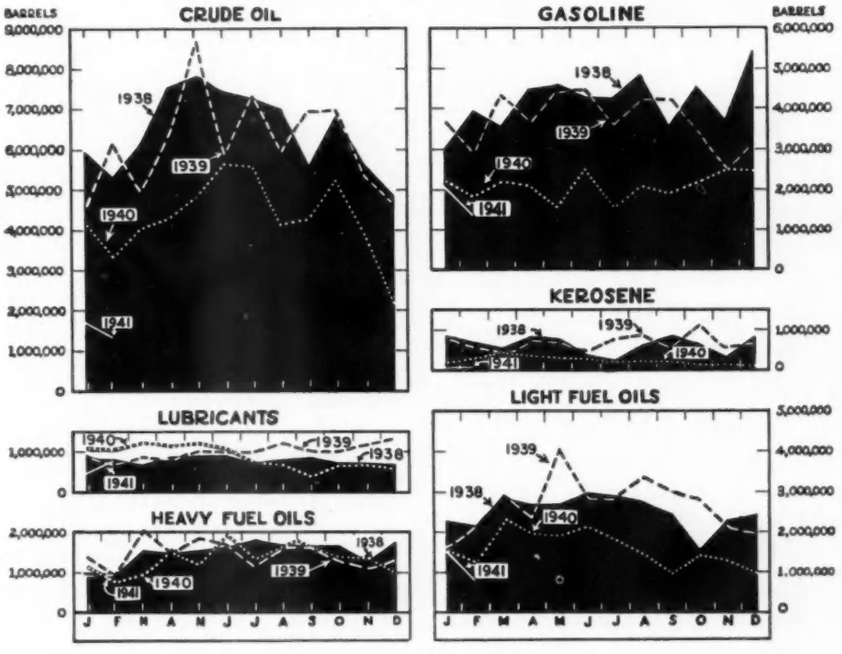
Oil Exports About One Third Lower Than Year Ago

Figures indicate barrels, and are from Bureau of Mines

ITEM	FEBRUARY 1940	FEBRUARY 1941	FEBRUARY Percent Change	FIRST 2 MONTHS 1940	FIRST 2 MONTHS 1941	FIRST 2 MONTHS Percent Change
Crude Oil	3,327,000	1,342,000	— 59.7	7,529,000	3,029,000	— 59.8
Products:						
Motor Fuel	1,903,000	1,365,000*	— 28.3	4,177,000	3,410,000	— 18.4
Aviation Gasoline	279,000	355,000†	+ 27.2	457,000	795,000	+ 74.0
Kerosene	298,000	82,000	— 72.5	689,000	174,000	— 74.7
Gas Oil and Distillate	1,234,000	791,000	— 35.9	2,783,000	2,386,000	— 14.3
Residual Fuel Oil	769,000	975,000	+ 26.8	1,908,000	1,977,000	+ 3.6
Lubricants	1,089,000	744,000	— 31.7	2,157,000	1,278,000	— 40.8
Wax (thousands of pounds)	28,267	10,950	— 61.3	49,409	24,179	— 51.1
Coke (short tons)	5,500	15,000	+ 172.7	22,100	26,300	+ 19.0
Asphalt (short tons)	24,100	13,400	— 44.4	43,400	35,300	— 18.7
Miscellaneous Oils	211,000	45,000	— 78.7	251,000	84,000	— 66.5
‡ Total Refined Products	5,765,000	4,190,000§	— 27.3	12,491,000	9,721,000	— 22.2
Total Crude and Products	9,092,000	5,532,000§	— 39.2	20,020,000	12,750,000	— 36.3

* Includes benzol—23,000 barrels. † Includes 63,000 barrels anti-knock compounds. ‡ Not the sum of the above figures, some of which do not indicate barrels. § Exclusive of 11,000 barrels exported from non-contiguous territories but inclusive of 623,000 barrels shipped from U. S. to territories and inclusive of 115,000 barrels withdrawn from bond for export.

U. S. Exports of Crude Petroleum and Refined Products



Source of Data: Bureau of Mines.

Changes From Year Ago in Stocks of Crude and Refined Oils in The United States

(Figures indicate Barrels)

LATEST WEEKLY DATA

(Sources: Crude stocks, Bureau of Mines; all other figures, American Petroleum Institute)

STOCKS OF:	April 19, 1940	April 19, 1941	Percent Change
Gasoline	103,622,000	97,899,000	— 5.5
Gas Oil & Distillate	24,290,000	28,410,000	+17.0
Residual Fuel Oil	102,603,000	95,636,000	— 6.8
Crude Oil	*252,269,000	†265,160,000	+ 5.1

LATEST MONTHLY DATA

(Source: Bureau of Mines.)

ITEM	Stocks at End of February 1940	1941	Percent Change
SUMMARY—			
Crude Petroleum:			
Refinable in U.S.	244,417,000	264,432,000	+ 8.2
Heavy in California	13,408,000	11,886,000	—11.4
Natural Gasoline	4,757,000	5,311,000	+11.6
Refined Products	270,464,000	277,894,000	+ 2.7
Total, all oils	533,046,000	559,523,000	+ 5.0
Days' supply:			
February basis	144	139	— 3.5
2 Months' Basis	137	138	+ 0.7
PRODUCTS—			
Gasoline:			
Finished	92,721,000	88,697,000	— 4.3
Unfinished	4,757,000	5,311,000	+11.6
Total	97,478,000	94,008,000	— 3.6
Aviation Gasoline	4,264,000	6,672,000	+56.5
Kerosene	4,302,000	7,634,000	+77.5
Gas Oil & Distillate Fuels	24,640,000	34,875,000	+41.5
Residual Fuel Oils	89,784,000	84,049,000	— 6.4
Lubricants	7,825,000	8,790,000	+12.3
Wax (Thousands of pounds)	82,631	119,150	+44.2
Coke (short tons)	628,000	375,000	—40.3
Asphalt (short tons)	647,000	760,000	+17.5
Road Oil	809,000	760,000	— 6.1
Miscellaneous	320,000	365,000	+14.1
Other Unfinished Oils	36,495,000	39,284,000	+ 7.6

* Stocks April 13, 1940.
† Stocks April 12, 1941.

Practical Operating Hints for

1. LEASE CONSTRUCTION

Energy from Exhaust of Single-Cylinder Engines Utilized for Ventilation

This engine house is automatically ventilated by arrangement of the exhaust outlet.

A COMPANY operating in Western Kansas makes it a standard practice to install large-bore, single-cylinder 2-cycle engine exhaust outlets in a manner that the engine house will be ventilated automatically when the engine is running.

The exhaust pipe normally consists of a single line extending from beneath the cylinder downward to the floor, and then under the floor to an outlet above ground outside. The 7-inch engine exhaust line is allowed to exhaust into a length of 12 or 14-inch casing that leads to the outside. This larger line extends under the floor to a point just below a steel floor grating that covers a 3-foot square opening in the concrete floor surrounding the exhaust pipe. The smaller exhaust line then projects into the larger pipe several feet, as shown in the photograph.

The jet-effect of this system effectively draws out engine fumes and gases from the engine room while the engine is running.

2. MOTOR CARE

Inverted Drum Gives Ample Protection

Half of an oil drum, inverted, gives weather protection to this pump motor.

WHERE electric drive is used on pumping wells, provision must be made to protect the motor against possible soaking with oil during well-cleaning operations. One operator fashions an effective cover from half of an oil drum, notching it on one side to slip over the motor shaft, and crimping the base to engage the base lugs of the motor and provide a support which will keep the head of the half-drum from contacting the motor itself.

This cover, with vertical slits cut around the sides to provide ventilation, may also be used as motor protection in wet weather, the drum serving to exclude rain without providing a housing so tight as to raise the working temperature of the motor above the rated figure.

The drum cover is easily removed for working with the motor, but effectively protects it against mud, water and oil, as well as tampering by trespassers on the lease.

3. GADGETS

Portable Pump Is Motor-Driven

DEWATERING fire-wall enclosures, pumping yard or field sumps, and drying tank bottoms for cleaning or work-overs require use of a small pump.

On leases where electric power is available, combination of a small motor with a single-stage volute centrifugal pump, preferably of the open impeller type, on a portable stand permits pumping a wide range of fluids without an increase in the lease crew.

Such a unit, mounted over the wheels of a heavy warehouseman's truck on a steel bedplate welded to the side members of the truck frame, provides adequate rigidity to withstand transportation and running vibrations, and keeps the unit clear of the ground, facilitating connecting suction and discharge lines.

A folding support, hinged to a through bolt near the handles, is arranged to swing within the shafts for transportation, and to be swung through slightly more than 90 de-

This mobile motor-driven centrifugal pump serves many purposes on lease.

THE PRODUCTION MAN . . .

grees to lock against pins in the shafts to insure steadiness when used as support. A spring latch on one side of the frame holds the support in a horizontal position during transportation.

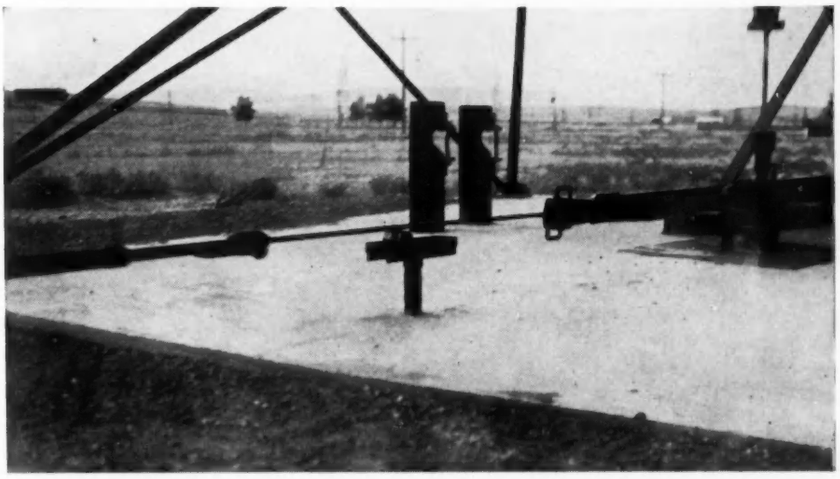
4. PUMPING HOOKUP

Rod Vibration Cut By Bearing Support

TO minimize vibration due to reversing movement of pull rods at oil well pump jacks, Continental Oil Company installs frictionless roller heads on leases in the Big Muddy field, near Glenrock, Wyoming. When such installations are made, the equipment is installed in the concrete pad beneath the derrick.

The apparatus consists of a section of 2-inch pipe, to which is welded two short sections of angle iron, or structural steel from an I-beam. The length is sufficient to obtain full movement of the pull rod, which is supported upon a short tubing nipple, rolling in the channel of the I-beam, or between the two sections of angle iron. Angle iron is preferred to a solid section of I-beam, as the open space between the two side rails permits sand and other foreign matter to drop away without causing wear on the moving parts.

When the installation is made, the apparatus is set sufficiently high so the pull rods bear on the roller without slapping or jerking.



The roller head support on this pull-rod installation minimizes rod vibration.

The roller is sometimes lubricated, but it is said that satisfactory operation is obtained when the nipple rolls dry. Lack of oil prevents accumulation of abrasive soil, and, as the roller has freedom of movement, no squeaks develop.

5. GOOD HOUSEKEEPING

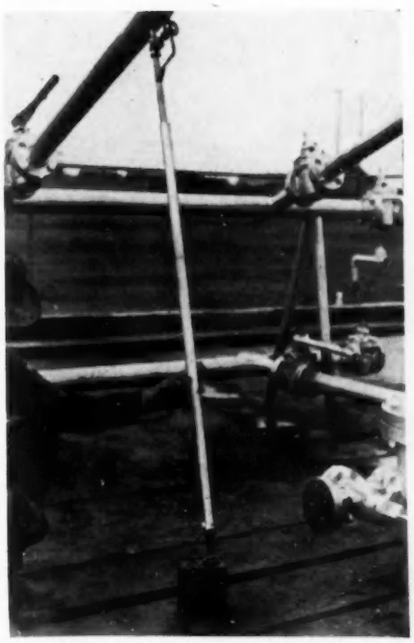
Telescopic Pipe Aids When Sampling

TO avoid puddles and splashes of oil that may accumulate on the derrick floor and Christmas tree from the overflow each time oil lead-line samples are taken, one company installed a novel but efficient extension to the bleeder valve.

The bleeder valve being some five or six feet above the floor, a 4-foot length of ½-inch pipe was connected to the valve outlet and a 4-foot length of 1-inch pipe, tapered down and welded to a short ½-inch nipple on the lower end, was slipped over the downward-projecting ½-inch length.

A small handle or hook welded to the lower end of the trombone-like extension allows the pumper to telescope the lower tube up as high as necessary to insert the end into the neck of the sample can and then allow it to set back down while he obtains the sample. Unless the valve is opened too suddenly, the long extension has a dampening effect on the usual initial burst of gas and oil, thus holding splashing to a minimum. A ¾-inch hole drilled through the wooden floor covering the cellar provides a resting place for the lower end of the extension while not in use, and allows drippings from the pipe to fall into the cellar.

This set-up contributes materially toward maintaining a neat and well-painted appearance of the floor and well fittings at each location.



A telescopic pipe from the bleeder valve cuts dripping when sampling.

THE practical operating hints for the drilling rig and production man, appearing in these features each week, are secured from oil fields everywhere and offer suggestions that will help to improve field efficiency and safety. The items give an excellent picture of the remarkable ingenuity being exercised by the operating divisions of the industry. Contributions to these features will be paid for at the rate of $5 for each illustrated item accepted. Address contributions to "The Editor, THE OIL WEEKLY, Houston."

2 Reasons Wh
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THE TWO BIG REASONS why Mission Valves cost far less to use are: 1. New, Universal 308 Compound Valve Inserts; 2. Replaceable valve seat bushings.

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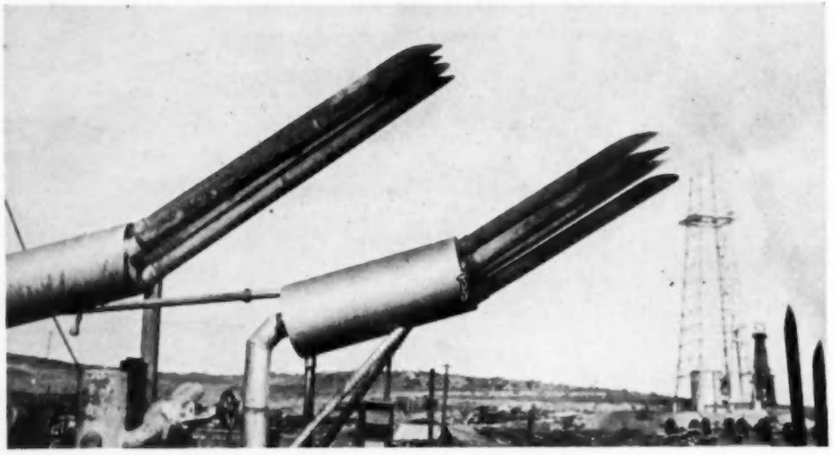
Your pumps stay running longer and cost less to repair when equipped with Mission Pump Parts

Practical Operating Hints for

1. RIGGING UP

Close-Connected Compact Muffler Minimizes Noises of Exhaust from Pump Engine



These multiple-exhaust outlets for mud pumps minimize objectional exhaust noise.

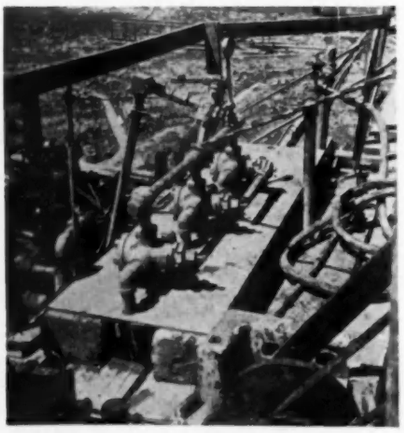
DRILLING in the more congested town-lot or business district areas made it necessary for one contractor to provide a simple, yet efficient steam exhaust muffler for his mud pumps to minimize possible complaints that might be raised due to exhaust noises.

A close-connected, compact muffler does away with the necessity of laying a long exhaust line terminating at an expansion chamber near the outer edge of each location. A 4-foot closed section of 20-inch casing was welded to an especially constructed 6⅝-inch upward tilting exhaust line leading from each pump exhaust manifold. Four 5-foot sections of 4¾-inch light casing, threaded and screwed into as many collars welded to openings in the end of the chamber, conduct the steam upward.

Sharp exhaust noises were cut to a minimum with this assembly, which also made it possible to remove and tear out each individual pump in a shorter time, independently of the exhaust lines of other pumps and the drawworks.

2. RIGGING UP

Blowout Preventer Valves Unitized



Mounting blowout preventer valves on steel plate offers several advantages.

BY mounting the three quarter-turn valves providing control of the rams on the blowout preventer assembly on a ½-inch steel plate, and drilling holes at the proper points to permit entrance of the required pipes, the valves are held firmly in place, no exposed piping is required on the derrick floor, and rigging up is simplified.

The steel plate, provided with holes drilled along its edges, may be mounted on a pair of heavy rig timbers to bring the valves to a level permitting more ready operation, and the plate spiked in place to prevent shifting and possible strain on incoming pressure lines.

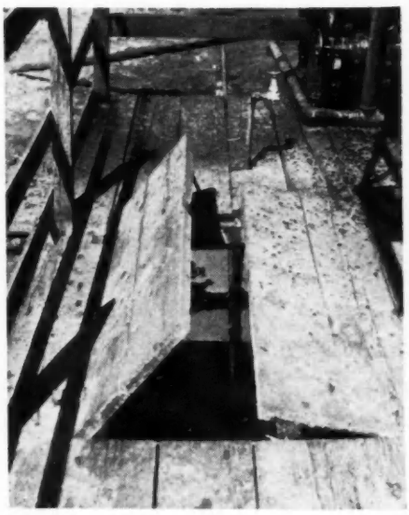
Mounting the valves on a steel plate with all lines carried below the support permits quick inspection of the valves, and allows them to be removed or worked on in place when such a procedure becomes necessary.

3. RIGGING UP

Trapdoors Cut in Derrick Floor

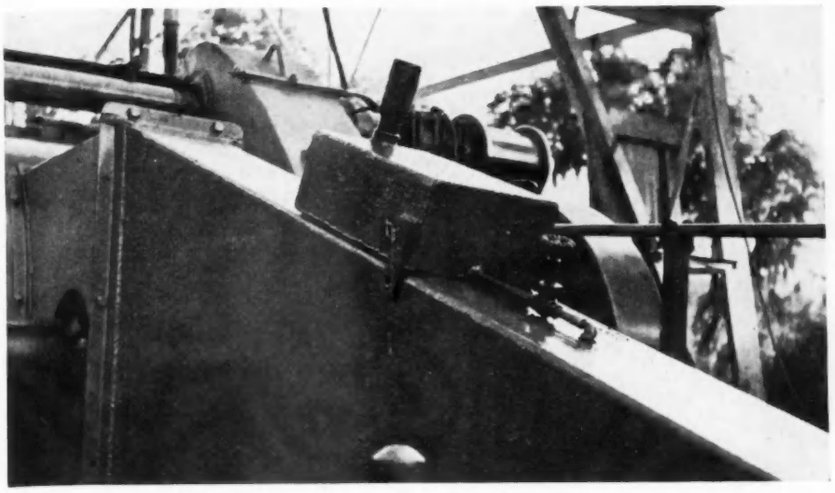
A SAVING in operating and maintenance costs may be made by use of trapdoors cut in a derrick floor of the elevated wood-plank type. During times when the cellar is flooded or the entire space below the floor is flooded or marshy, less time is consumed in breaking out fittings at or near the well head than would be required if the men were forced to crawl through mud and water below the floor to get at the fittings.

The trapdoors may be hinged with short lengths of canvas belting. By cutting them exactly to fit the opening between the floor joints, no appreciable weakening or resultant deterioration of the floor will result. Drilling a ¾-inch hole in each section near the center edge provides a convenient means of opening them with the aid of a small wire hook.



Derrick floor trapdoors provide convenient access to well-head fittings.

THE DRILLING RIG . . .



This tank straddling the chain housing holds several days' supply of lubricant.

When not convenient to cut trapdoors at the several places needed, it quite often is possible to arrange the lead-lines, unions, check valves, and other fittings in such a manner that they all can be reached by simply removing two or three adjacent lengths of the plank flooring. Instead of using spikes to hold these several planks in position, several lag-screws may be used, care being taken to use steel washers and to partly countersink the screw heads below the surface of the flooring.

Aside from the cumulative time saved by the field crews, the arrangement also provides a definite saving by not splintering or destroying the various planks that would ordinarily have to be ripped up if nails were used in all of them.

4. LUBRICATION

Extra Oil Supply For Rotary Chain

A SUPPLY of lubricant for rotary chain to last several days may be stored in a welded tank straddling the chain cover. Lugs prevent side displacement, and a clip bolts around the usual lifting eye.

The oil line, led from the lowest point in the tank, is completed with a valve for flow regulation, and an ell with pointed nipple directs the drip directly upon the chain below.

For transportation, the tank may be disconnected by removing the bolts in the clip, and handled with other light equipment.

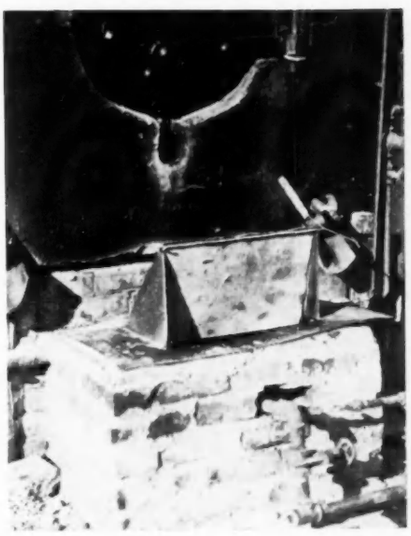
5. BOILER OPERATION

Special Automatic Draft Control

NATURAL gas fuel costs are being lowered considerably by use of a simple device made by the fireman on a battery of boilers that supplies steam to a number of wells pumped by steam engines. Due to several characteristics of the boilers, among which was the fact that the fire-box combustion spaces had been changed somewhat, it was found difficult to maintain the fuel-air mixture ratio at the optimum point, where the greatest heating efficiency was obtained with the minimum volumn of fuel consumed.

An automatic draft control was made of light sheet iron and installed above a small brick chamber in front of the boiler. The rectangular down-draft opening, measuring approximately 18 by 12 inches, was closed off or restricted by suspending in it a light sheet of metal of the same dimensions. This curtain was welded at several points along the top to a length of ¼-inch welding wire long enough to project over the sides of the vent opening an inch or two. The projecting ends rested in a notch at each side, making virtually a knife-edge bearing and allowing the curtain to swing freely.

As more or less gas is fed in to the combustion chamber, more or less air likewise is drawn in by the suction action, drawing open the draft curtain. A small weight or short pipe nipple hung on a short arm projecting out at right angles to the welding wire support, helps to regulate and maintain the proper range of action anticipated for day-to-day operation of the boiler. Since much air is drawn in through the burner holes and other openings in the front of the fire-box, this draft control does not usually open more than a few inches for normal firing.



Automatic draft control for boiler is provided through this brick chamber.

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There are sound reasons back of the uniform success of patented X Mayari Rods. They are especially designed for just such tough work. They are made of a special nickel-chromium, naturally-balanced alloy that has excellent resistance to shock, fatigue, embrittlement and general wear.
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See for yourself how X Mayari Rods can ease pumping troubles and fatten profits. Try a string. You'll be surprised at their low price, too.
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HIGHLIGHTS IN THE WEEK'S NEWS

Washington

Additional One-Cent Tax on Gasoline Proposed in Congress

An increase of one cent per gallon in the federal tax on gasoline, bringing it to 2½ cents per gallon, featured the schedule of new and increased taxes through which the Treasury plans to raise additional revenue of $3,600,000,000 a year, submitted to the House Ways and Means Committee April 24 by John L. Sullivan, assistant secretary of the treasury.

That increase would bring in $255,000,000 a year, Sullivan told the committee, or more than one-fourth of the total to be raised through new and increased excise taxes.

As a result of the increase of ½ cent per gallon made in the 1940 revenue act, the treasury this year will receive additional revenue of something over $125,000,000. Total collections for the fiscal year ending June 30, next, will be in the neighborhood of $335,000,000, it is indicated by the receipts for the first nine months, compared with $226,000,000 for the last fiscal year.

With the additional cent a gallon, it is estimated that collections for the coming fiscal year will run very close to $600,000,000.

No estimate is possible of the effect of the new tax bill on the oil industry at this time. The bill has not yet been written, and will not be drafted until after hearings which will be opened by the committee April 28, so that there is no indication whether any changes will be made in the depletion provisions of the present law.

On the basis of the treasury recommendations, however, both individuals and corporations in the industry will take seriously increased tax responsibilities.

The treasury proposes that all income be made subject to surtax, with rates starting at 11 percent, but it is generally believed that the committee will scrap this for a much smaller increase on taxpayers in the lower income brackets.

Corporation taxes will be increased by surtaxes of five percent on the first $25,000 of net income, and six percent on the balance, and the excess profits tax will be revised with reductions in credits and increases in rates.

Other taxes which will affect the industry include a doubling of the present rates on automobiles and parts, two cents on bank checks, increased rates on telegraph, cable and long distance telephone calls; five percent on passenger tickets in excess of 35 cents, and five percent on telephone bills.

With the enactment of the new measure, the federal tax bill of the Nation will be raised by one-third to $12,667,000,000 a year, said to be the highest tax total ever imposed on the United States, but still less onerous than the burden of English citizens.

Announcements of the amount at which the Treasury aims quashed hopes which had been held that a "middle of the road" policy would be followed with respect to taxes, holding them down to around $1,500,000,000. But the higher total, it was explained, is in conformity with the Treasury's aims to cover two-thirds of the government's expenditures by taxes and one-third by borrowing. Even if the full amount of nearly $13,000,000,000 in tax revenue is realized, it still will be necessary for the Treasury to borrow some $6,000,000,000 next year.

March revenue from the federal gasoline tax totaled $26,439,544, a drop of nearly $2,350,000 from the $28,785,830 collected in February but $11,500,000 above the $14,909,664 reported for March, 1940, it was announced last week by the Internal Revenue Bureau.

Collections from lubricating oil increased from $2,216,132 in February to $3,536,245 in March, where they compared with the $2,074,042 of that month last year, and receipts from pipe-line transportation also increased, totaling $1,291,550 in March against $926,524 in February and $1,032,149 in March, 1940, it was stated.

Increases in the oil taxes last July 1 will give the treasury an increased revenue of probably $125,000,000 for the current fiscal year, it is indicated.

Collections from the gasoline tax during the nine months ended with March totaled $252,426,461, an increase of $81,468,801 over the $170,957,660 of the same period a year ago, while lubricating oils returned $27,382,823, an increase of $3,954,120 over $23,428,703, and pipe line transportation revenue was 9,185,547, an increase of $551,883 over $8,633,664.

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Allowables

Bureau's May Demand Forecast Up 90,000 Barrels

Domestic demand for petroleum products in May will require the production of 3,799,700 barrels of crude oil daily, 90,400 barrels more than foreseen for April and 2 percent above the actual demand in May, 1940, it was forecast last week by the United States Bureau of Mines.

At the same time, however, the bureau warned that while domestic demand during the first half of 1941 will be much greater than in the same period last year, exports have fallen off and imports are increasing, so that required new domestic production may be as much as 2 percent less than in the first half of 1941.

"During the first six months of 1940," it explained, "the domestic demand for all oils approximated 643,000,000 barrels and exports amounted to 70,000,000, resulting in a total demand for all oils of 713,000,000 barrels. An increase of about 42,000,000 barrels in the stocks of all oils indicated a new supply of 755,000,000 barrels, of which 39,000,000 was imported and 716,000,000 represented new domestic production of crude, natural gasoline and benzol.

"On the basis of existing data and trends, the Bureau of Mines anticipates that during the first six months of 1941 the domestic demand for all oils will be about 55,000,000 barrels greater than last year and that exports may be 25,000,000 less, resulting in a total demand for all oils of about 743,000,000 barrels, or a gain of 30,000,000 barrels (between 4 and 5 percent). Assuming a seasonal increase in total stocks of only 6,000,000 barrels and total probable imports of 48,000,000 barrels (a gain of almost 10,000,000 barrels), the required new production of domestic oils would amount to about 700,000,000 barrels, or about 2 percent less than for the same period last year.

"While these figures represent only a rough approximation of the demand situation, they do indicate the relative trends in the domestic and foreign markets. During the latter half of 1941, any increase in domestic demand will be more directly reflected in required domestic production because last year's production was more closely coordinated with demand in that period and exports had been reduced to almost minimum levels."

The bureau found that daily average crude production during the four weeks March 8 to April 5 was 3,651,000 barrels and runs to stills 3,608,000 barrels, while during the period domestic stocks increased an average of 45,000 barrels a day, indicating a demand of 3,606,000 barrels, virtually the same as runs.

Strong Domestic Market

The most notable change shown during the first quarter of 1941 was unexpectedly strong domestic market for motor fuel, with sales at a level of

from 12 to 13 percent above 1940, it was pointed out.

"While these sales undoubtedly have been inflated by buying in advance of a rising market, it seems a fair assumption that the trend of the domestic demand for motor fuel is from 10 to 11 percent above last year," it was commented. "Stocks of finished and unfinished gasoline, as indicated by current figures, approximated 98,000,000 barrels on March 31, 1941. This figure is about 6,000,000 barrels less than the peak of last year and includes several million barrels more of essential aviation gasoline stocks. While some groups in the industry may still consider these stocks excessive, they do not seem to be sufficiently high to be a disturbing factor in view of the strong demand for motor fuel. With the increase in the demand for gasoline more in line with that expected for other products, higher and more normal gasoline yields and normal seasonal stock reductions seem in order.

"The domestic demand for residual fuel oil showed an increase of about 9 percent during the first quarter of 1941 and may show an increase over last year of 15 percent in the second quarter. The total demand for distillate fuel oils will probably be several percent less in the first half of 1941 than last year because of a small gain in domestic demand and a large reduction in exports.

"In view of the present trends of demand, the bureau believes that crude runs to stills at a level close to 3,800,000 barrels daily will be required during the summer months. However, prompt adjustment either upward or downward may be essential as further evidence of the trend of actual demand becomes available."

The bureau forecast placed domestic demand for motor fuel in May at 58,500,000 barrels, an increase of 10.5 percent over the actual demand in that month last year. Exports, based on forecasts by the principal exporters, are set at 1,700,000 barrels, or 200,000 barrels less than forecast for April, but, it was pointed out, this figure does not include any estimate of motor fuel imported in bond for re-export.

Stocks of finished and unfinished gasoline amounted to 95,646,000 barrels on February 28, or 3,649,000 barrels less than on the same date in 1940, it was pointed out. Statistics of the American Petroleum Institute indicate that gasoline inventories increased about 2,500,000 barrels during March, which would bring them to about 98,100,000 barrels at the close of the month, or 54.1 days' supply compared with 62.5 days on March 31, 1940, and 54.5 days on March 31, 1939.

Benzol production and direct sales of natural gasoline are estimated as 1,700,000 barrels, making an indicated refinery production of 55,500,000 barrels, which the bureau distributed among the several districts, as follows:

East Coast, 6,880,000 barrels; Appalachian, 2,110,000 barrels; Indiana-Illinois, 12,310,000 barrels; Oklahoma, 2,690,000 barrels; Kansas, 3,110,000 barrels; Inland Texas, 3,550,000 barrels; Texas Gulf Coast, 14,020,000 barrels; Louisiana Gulf Coast, 1,630,000 barrels; Inland Louisiana-Arkansas, 1,040,000 barrels; Rocky Mountain, 1,510,000 barrels; California, 6,650,000 barrels.

Natural gasoline to be blended at refineries is estimated as 5.8 percent of the total refinery production, or 3,220,000 barrels. The yield of straight-run and cracked gasoline is estimated as 44.5 percent which, applied to the production of 52,280,000 barrels, gives crude runs of 117,490,000 barrels, or 3,790,000 barrels a day.

The estimate for foreign crude runs to stills is 3,900,000 barrels, compared with actual runs of 3,384,000 barrels in May, 1940. Exports are placed at 2,500,000 barrels, compared with actual shipments of 4,886,000 barrels last year, and crude to be used as fuel and losses is placed at 1,700,000 barrels.

The bureau, on the basis of these figures, placed the total demand for domestic crude oil in May at 117,790,000 barrels, or 3,799,700 barrels a day, allocated among the several producing states, as shown in an accompanying table.

Bureau of Mines Forecast of Crude Oil Demand for May

State	Forecast May, 1941	Forecast April, 1941
Texas	1,382,200	1,355,300
California	598,100	596,300
Oklahoma	440,000	429,300
Illinois	336,100	336,000
Louisiana	320,300	299,700
Kansas	213,900	200,700
New Mexico	113,900	109,000
Wyoming	90,900	88,700
Arkansas	83,900	75,700
Pennsylvania	49,100	49,000
Michigan	40,000	44,000
Indiana	23,900	23,700
Mississippi	22,900	20,300
Montana	21,300	21,300
Kentucky	17,100	16,700
New York	14,000	14,000
West Virginia	11,100	11,000
Ohio	11,000	10,000
Colorado	5,200	4,300
Nebraska	4,800	4,300
	3,799,700	3,709,300

Texas Sets Allowable Below Bureau Demand Figure

The Texas Railroad Commission on April 24 issued a state-wide proration order which it calculated will result in a daily average production of 1,367,619 barrels of crude oil in Texas during May. The United States Bureau of Mines previously had estimated consumer demand in Texas for the period at 1,382,200 barrels daily.

The formula adopted by the commission in March remains in effect, and the allowable was fixed at 1,417,222 barrels, but from this is deducted 3.5 percent which is the amount indicated by experience that wells will produce less than their assigned quotas.

All fields in the state are to be shut in nine days, except in the Panhandle, which will close in only four days. All fields will be closed in on May 3, 4, 10, 11, 17, 18, 24, 25 and 31. The Panhandle will be closed on May 10, 17, 24 and 31.

Texas Receives Bill for Market Demand Allocations

Into the Texas legislative hopper last week went a new market demand bill for the oil industry. Under its provisions, the formula now used by the Texas Railroad Commission to distribute oil would be specifically authorized by the legislature.

Under its formula, the commission determines what the demand is throughout Texas for oil of different grades, then distributes that equitably among all the fields producing a particular quality of oil, taking into consideration the number of wells, the density of drilling, depth of the production, and similar factors.

California Refuses to Up May Allowable Figure

Members of the Conservation Committee of California Oil Producers vetoed proposals for an increase in the state production allocations from the April figure of 571,000 barrels daily to a proposed figure of 585,235 barrels daily for May.

The refusal to increase the state quota was attributed to opposition of producers of low-gravity crudes to any increase in production in the absence of a higher posted price for their output. Opposition was based on inability of the individual producer to step up production of wells in the face of rising production costs without a compensating increase in posted prices to cover cost of remedial work and additional drilling.

In order to provide proration quotas for new wells brought in during April, a further reduction of 2 barrels daily to 142 barrels was made in allocations to the state's 1045 top wells. A corresponding reduction was ordered in allocations to intermediate well classifications, while quotas assigned to marginal wells were left unchanged.

Louisiana Allowable Slightly Above Bureau Estimate

Louisiana was given an increased allowable for May of 19,431 barrels over April, by the state minerals department last week. May allowable is 320,324 barrels.

Of the increase, 16,832 barrels went to South Louisiana, boosted to 250,023 barrels. North Louisiana was boosted 2599 barrels to 70,301 barrels.

Bureau of Mines estimate of demand for the month is 320,000 barrels daily.

Oklahoma Demand Hearing Set for April 29

The Corporation Commission of Oklahoma will hold a hearing at 10 a. m. Tuesday, April 29, in Oklahoma City, to determine market demand for May.

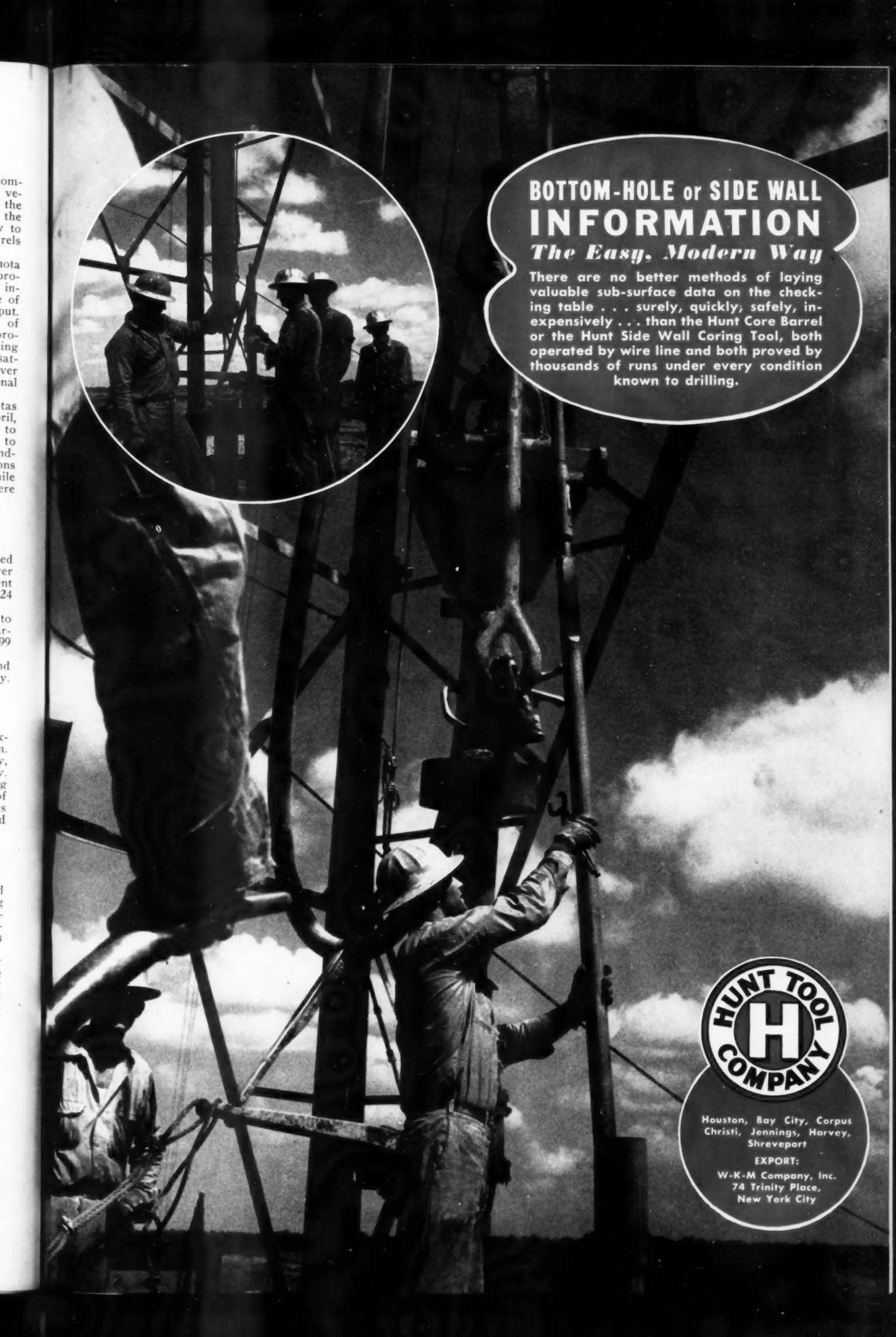
Oklahoma has been operating during the past three months on an order of 400,000 barrels daily. The United States Bureau of Mines estimate for demand in May is 440,000 barrels.

Suit Attacks Texas Method Of Allocating Production

Continental Oil Company has filed suit in 126th District Court, attacking the formula which the Railroad Commission of Texas uses in allocating production between fields. The case has been set for hearing on April 28.

In a petition filed for the company by Dan Moody, Austin attorney, the company contends it has a demand for 4000 barrels daily, which can be produced from its wells in the Conoco Driscoll field, Duval County, without physical waste. It is now allowed to produce 1300 barrels a day.

In the event Continental Oil Company is successful in its suit, the commission then might be required to allocate to each Texas oil field that amount of oil which could be produced without waste and sold. Observers familiar with the plan believe this would result in selective buying, in that purchasers would buy oil in those fields where they produce and decline to connect to other fields.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Associations

C. O. Diller Named Head of Petroleum Electrical Group

C. O. Diller, Lone Star Gas Company, Dallas, was elected president of the Petroleum Industry Electrical Association when the organization held its annual convention in Tulsa last week in conjunction with the Petroleum Electric Supply Association. He succeeds O. V. Summers, Houston. More than 300 attended the meeting.

Other officers named were L. G. Wainman, El Paso Natural Gas Company, vice president, and J. F. Collerain, Houston, re-elected secretary. H. C. Gear, Lone Star Gas Company, Dallas, was elected chairman of the Cathodic Section, succeeding L. F. Scherer, Texas Pipe Line Company, Houston; J. F. McElhatton, Panhandle Eastern Pipe Line Company, Kansas City, was named vice chairman, and G. R. Olson, United Gas Pipe Line Company, Shreveport, was re-named secretary.

Shreveport was selected as the 1942 convention city, with the meeting to be held April 22-24.

Principal address was given at the banquet session by A. A. Nicholson, director of The Texas Company, New York, who spoke on "The New Industrial Frontier."

Abstracts of papers follow:

Spot Coating and Cathodic Protection

By Donald B. Good,
The Texas Empire Pipe Line Company

Pipe lines may be laid bare, may be coated through selected sections or areas, or may be given a continuous coating and wrapping. Experience has shown that complete coating of a pipe line is apt to prove the most economical practice, both in first cost and in maintenance costs. Lighter weight pipe can be used, and cathodic protection can be more readily applied. Coating costs for a partially coated line are not materially less. The cost of cathodically protecting bare or partially coated lines far exceeds costs of similar protection as applied to a well coated pipe line.

Laying pipe lines bare for their entire length is not common practice today, since they carry more current and accumulate or discharge these currents more often than coated lines.

Chemical Ground Anodes

By A. W. McAnneny and D. H. Bond,
The Texas Pipe Line Company

During the past several years, electrolysis engineers have been increasingly conscious of the necessity of designing and developing a more suitable and economical type of ground bed for cathodic unit installations. Most commonly used ground beds consist of either junk castings, junk pipe or carbon or graphite rods.

Main objection to use of carbon rods is the counter e.m.f. which is set up between the pipe line and carbon rods, as back voltages as high as 2¼ volts have been observed at various installations.

By use of sufficiently high current densities, it is possible to passify zinc, iron, cadmium and lead in sulphuric acid. Tests were made on two type cells and briefly summed up concludes the following: the alkaline cell gives very low resistance to ground, is inexpensive to install, seepage through flue tile is negligible, sodium hydroxide is expendable but inexpensive, sodium hydroxide dissipates at a rate much lower than predicted by electrochemical equivalent, soil adjacent to pipe line is made alkaline, iron anode is not corroded and back e.m.f. is 1.7 volts. The acid cell gives low resistance to ground, inexpensive to install, present type container gives excessive seepage, sulphuric acid is not expendable after adjacent soil is acidulated, sulphuric acid is not expensive, water is consumed due to electrolysis, lead is not corroded, and back e.m.f. is 2.2 volts.

A chemical anode installation involves no high transportation costs and there is no welding. Discharging 40 amperes, the alkaline cells should theoretically dissipate 1150 pounds of sodium hydroxide per year which involves a cost of $44.

Application of Non-Polarizing Electrodes in Electrolysis Measurements

By David Harrell,
Houston Pipe Line Company

Faraday's law of the dissipation of metallic ions in electrolysis as applied to cathodic protection is basic. Discussion of normality constants and Nernst equation of measurement of the hydrogen ion concentration by the potential of the pipe to the soil; the experimental proof of the theory of hydrogen ion concentration change with potential change.

It is concluded that if the potential measurement of pipe line to soil is an indicator of sufficient pH to stop corrosion, the present method can be continued.

Industrial Protective Lighting

By Roy J. Thompson,
General Electric Supply Corporation

Lighting can be made an effective protective method against sabotage of industrial plants. This system of maximum effectiveness employs not only proper lighting, but fences and guards as well.

Three steps must be considered in every lighting plan. First, the light must work for the advantage of the guards patrolling the plant and to the disadvantage of any intruder. Second, the system should be devised in such a manner that detection of an intruder is a certainty, and, third, the installation must be reliable in every detail.

An outdoor protective lighting installation should serve two areas—the boundary line, and the inside property area. First line of defense is the fence, preferably high and with a barbed wire tip, completely surrounding the plant.

There are three acceptable methods of providing boundary lighting. One is to mount floodlights in groups of two about 25 feet above the ground and 50 to 80 feet inside the boundary. Floodlights should be equipped with horizontal spread-beam lens since the horizontal area to be covered by each floodlight is much greater than the vertical area. Spacing of floodlights will depend upon horizontal spread of the beam, size of lamp and whether dual coverage is desired. From 100 to 175 feet is practical. An economical method of fence lighting is to use 1000- or 1500-watt, narrow beam floodlights, mounted on fence line in pairs at least 40 feet high. Disadvantage of this system is that spotty illumination will occur. Best method of boundary lighting uses enclosed street lighting units mounted 25 feet high, spaced at 150-foot intervals along fence line and using 300-watt or 6000-lumen series lamps. This intensifies illumination along fence line, eliminates shadows, reduces glare, overlapping distribution and is inexpensive to operate and maintain.

Resistance Bonding in Connection With Cathodic Protection

By C. H. McRaven,
United Gas Pipe Line Company

This subject deals with the problem of preventing damage to underground structures by stray currents from cathodic protection installations protecting adjacent structures. It is restricted to a relatively simple arrangement of a single isolated line crossing a protected line some distance from the drain point.

Assumed conditions prior to actual operation of the cathodic unit are: (1) the difference of potential between the two is the natural electro-chemical potential between the pipe and ground electrode at any point and is represented by the vertical separation of the two lines; (2) since there are no earth currents present, potential of ground should be constant and same volume of pipe to soil potential will be read regardless of location of electrode; (3) no tendency for a foreign line to either collect or discharge current and no voltage difference exists between the two lines, and the potential to ground is same for both. While these conditions are seldom found exactly this way, they will serve for the purpose of studying changes that occur due to the cathodic unit alone.

When unit is turned on, potential of the soil close to the drained pipe drops below normal while more remote soil has been raised slightly above its normal potential. Since drained pipe has decreased more in potential than the soil immediately surrounding it, it results in an increased externally applied difference in potential between the two, which in turn results in a flow of current from soil to pipe.

If the electrode is placed where the two lines are closest together, reading will indicate that the pipe is more positive to soil with unit operating than when not operating, and change in potential due to unit is greater with electrode at this point than at any other point equidistant from the foreign line. Point on foreign line that is subject to greatest tendency for current discharge resulting from unit is at the crossing. This is the condition existing when there is no metallic bond between the two lines, and represents one extreme.

By installing a solid bond, we can change the condition of current discharge at the crossing to current collection, and there is undoubtedly an intermediate point at which the foreign line neither discharges nor collects current. This means a bond with a resistance somewhat greater than that of a solid bond; one that will lower the potential of the foreign line until it is no more nor less than V_o volts below potential of electrode placed at the point where greatest tendency for discharge occurs. The most practical method of arriving at this resistance value is by trial and error.

Following are tabulated adjustments necessary to arrive at correct bond in actual case:

Trial	Current In Bond	Potentials	
		Unit On	Unit Off
1	5.8	.360	.640
2	6.2	.450	.610
3	7.6	.515	.600
4	8.4	.530	.600
5	9.0	.590	.590

A high value of 9 amperes was required since this was a welded line and the protected line was practically bare. Factors which control the amount of

current that must be drained are separation of the two lines, resistance of the foreign line, resistance to the foreign line coating, and current density on the protected line.

In general, it is not practical to increase the separation between lines or to increase resistance of the coating on the foreign line. Where 9 amperes were drained above, by coating 50 feet of the protected line, the current could be reduced to 4.5 amperes.

On 21 miles of continuous protection on an 8-inch line, resistance bonds were installed at 25 crossings. Average current drainage was 2.6 amperes with a minimum of 0.332 and a maximum of 14.6 amperes. Total current output of the units in one 6-mile section was 185 amperes, of which 56 amperes, or 30 percent, was drained from foreign lines.

Pipe Line Radio

By J. D. Browder,
Oklahoma Gas & Electric Company

Experimental research was begun in 1935 to ascertain whether a buried pipe line used for transporting crude oil could be employed for carrying electromagnetic waves so as to provide communication channels between stations located along the line.

In preliminary tests, 700 feet of 4-inch pipe line was assembled on insulating supports a few inches above the ground. This conductor was equipped with a telephone at each extremity to expedite the experiments. Adjacent to each end, a small terminal screw was welded to the inner pipe wall to facilitate electrical connections with the structure. Transmitting apparatus, including a 6-volt battery, was mounted inside a coupling reducer threaded onto the end of the pipe line, and a sheet metal cover supporting a pushbutton switch to key the transmitter was clamped over the open end of the reducer. This arrangement made it convenient to realize the advantages of a concentric circuit by installing a 20-foot length of ignition cable centrally supported inside the pipe by discs of insulating material, which cable served as a conductor.

On opposite end of line, another 20-foot inner conductor was similarly installed and extended from the open end of pipe, adjacent to which was placed a shielded broadcast receiver of the automobile variety with its antenna and ground terminals connected to the inner conductor and pipe wall, respectively. First signals transmitted came in so powerfully on all points of the receiver dial that it was necessary to lower the output of the transmitter by reducing the length of inner conductor at the transmitting station first to 15 feet, then to 10 feet and finally to five feet before the receiver volume control became normally effective.

Initial testing with a buried line was begun with one three miles long, four inches in diameter, and buried at average depth of 18 inches. Thirty-foot conductors were utilized, and a spark-coil transmitter installed at one end of the pipe line and an automobile broadcast receiver, mounted in a car, was placed about 3 feet from the other end with its antenna and ground terminals connected to the inner conductor and pipe walls, respectively. Signals at a surprisingly high power-level again were received, substantiating that the pipe line served as the conductor of these signals.

Pipe Lines

Richardson Pipe Line Builds West Texas 44-Mile Line

Richardson Pipe Line Company has been organized by Sid W. Richardson, Fort Worth producer, to operate the West Texas crude system being built to deliver Slaughter field crude sold on contract by Richardson et al to The Atlantic Refining Company. Thirty-one miles of carrier, involving 44 miles of 6-inch welded pipe that extends from Sundown, Hockley County, to the Wasson field, has been completed. It is scheduled to be in operation by May 1. The oil will be transported from the Wasson field by Aloco Pipe Line Company on a joint tariff to Hobbs, New Mexico, where connection is effected with The Atlantic Pipe Line Company. Aloco Pipe Line Company contracted to lay the line and the field gravity gathering system, which is connected to The Texas-New Mexico Pipe Line Company's Slaughter-Midland line on a temporary arrangement.

Build Four-Mile Oil Line To New Mississippi Plant

Paluxy Asphalt Company, headed by Eugene Constantin, Dallas, will lay a 4-mile 4-inch crude line from the Tinsley field, Mississippi, to its 3000-barrel refinery now under construction at Crupp, on the Y. & M. V. Railroad north of the field. The plant will be equipped with a cracking unit, and will also manufacture asphalt, using crude purchased from the Union Producing Company on a 5-year contract. It is slated to be in operation by mid-June. E. F. Bourg, vice president, will be resident manager, and H. J. Toups will be superintendent of operations.

Stanolind Increasing Size Of Short North Texas Lines

Stanolind Pipe Line Company has requested bids for construction of a 6-mile 4-inch extension from its Muenster townsite terminal to Voth, most active shallow pool in North Texas, and will also replace its Nocona-Muenster 26-mile 4-inch discharge line with 6-inch pipe in order to step up the capacity to 7500 barrels daily. Gravity gathering system will be utilized in the Voth area, with receiving tanks and booster unit to be located on the extreme south end.

Baird Places Novice Field Outlet in Operation

Baird Refining Company has placed in operation a 26-mile 4-inch crude line that extends from the Novice field, Coleman County, to its refinery near Baird, Texas. The Goldsboro pool is also given its first pipe line outlet through construction of a 6-mile lateral from the Novice field booster station.

Laterals Connect Several Pools to Magnolia Line

Magnolia Pipe Line Company has completed installation of a group of laterals from its Hull-Silk field to Ringgold 8-inch trunk line. A 7-mile combination 3- and 4-inch extension was built to the Shell-Coleman three-well pool, Archer County, and a mile of 4-inch lateral to the Vogtsberger 3-well pool. The Asylum 3-well pool, southeastern Wichita County, was tapped with a 2¾-mile 2-inch line.

Award Contract for 140-Mile Louisiana Gas Line

Southern Natural Gas Company, Birmingham, Alabama, has awarded contract to B. & M. Construction Corporation, Oklahoma City, for laying a 140-mile 14-inch welded natural gas pipe line from the Joaquin-Logansport field, centering upon the Texas-Louisiana border, to Perryville, Louisiana, were connection will be made with the company's Monroe-Birmingham 22-inch carrier.

Louisiana Compressor Station

Southern Gas Lines, Incorporated, has announced plans for a new compressor station to be built one mile south of Clarks, Louisiana, the project being made necessary by increased use of gas from the Monroe field at army camps around Alexandria, Louisiana.

Bindel Pool Has Outlet

Sinclair Refining Company has tied into The Texas Company's Bindel two-well pool, western Cooke County, through laying of a 1½-mile 4-inch lateral from its Ringling-Fort Worth carrier.

Short Michigan Line

Simrall Corporation is building eight miles of 4-inch line from its Freeman-Redding pumping station to the east Winterfield pool, Clare County, Michigan.

Financial

Texas Company Reports Domestic Improvement

Although net profit of The Texas Corporation for the first quarter of 1941 was sharply lower than for the like 1940 period, a "substantial improvement" occurred in the domestic industry in March both in price and volume of sales, W. S. S. Rodgers, president, announced at the annual meeting of stockholders held last week.

Estimated earnings of The Texas Corporation and subsidiaries for the three months ended March 31 were $6,600,000 after all charges, reserves, taxes, etc., equal to 61 cents a share on capital stock. This compares with consolidated net income of $12,800,000, or $1.18 a share, in the March quarter last year. Earnings for 1940 were announced previously.

Rodgers supplemented his survey of the company's operations and outlook for the industry contained in the company's recent annual report with information resulting from 1941 experience. He emphasized that the company and the oil industry in general will be able to meet all extraordinary demand caused by the preparedness program without curtailing oil needs of industry, agriculture and individuals, and without recourse to governmental financial aid.

Crude and Refined Oil Prices Are Marked Up

Markets for refined products continued to advance last week, and the crude market remained firm, having been featured by a 10-cent raise in postings in the Appalachian region and increases of 1 to 13 cents a barrel in crude prices in California.

Refinery gasoline was marked up again by plant owners and resellers of the Mid-Continent, the Middle West, Gulf Coast, and Atlantic Coast, and natural gasoline also was higher.

Minimum prices at which all grades of gasoline could be purchased in the Mid-Continent and Middle West were ⅛ cent a gallon higher than previously, and prices of high-octane gasoline ranged ⅛ cent higher than in the preceding week.

Natural gasoline was advanced ¼ cent to 3⅛ cents a gallon in the Mid-Continent, and was raised the same amount to 2¾ cents f.o.b. Breckenridge, Texas.

Demand for gasoline will continue strong, in the opinion of the Bureau of Mines, which last week estimated that domestic consumption in May would be over 10 percent greater than in May of last year. And the stocks of that product remain moderate in relation to the prevailing demand, as they represent only about 55 days' supply.

Shipments of gasoline against contracts currently are heavy in the Mid-Continent and the Middle West, and there is considerable inter-refinery trading, as some plant owners are obliged to seek outside supplies to augment their own production in filling contracts, although several last week reported that they were having little success in making purchases.

Pennsylvania Crude Raise

Posted prices of Pennsylvania grade crude oil were advanced 10 cents a barrel effective April 23. The increase was the second this year and the fourth since last November. The four advances together aggregated 55 cents, and the Pennsylvania grade oils are now within 35 cents of the levels at which they stood at this time last year, before declines commenced because of the loss of export markets through the war.

The increase of last week was described as due directly to increased demand at the western Pennsylvania refineries, although the improvement basically reflected the strengthening of the markets for lubricants. Domestic demand for lubricants has increased greatly under the national defense program and attendant busy industrial and commercial scene, and the expansion of domestic use has almost compensated for the loss of export business.

New quotations announced by the Joseph Seep Purchasing Agency of the South Penn Oil Company are as follows: Bradford-Allegany, $2.40 a barrel; Southwest Pennsylvania, $2.05; and Eureka, $1.99.

California Prices Advanced

On Thursday of last week Standard Oil Company of California announced an increase ranging from 1 to 13 cents a barrel for crude oil at the well in California. Unlike the company's adjustment announced March 12, the new posting applied to all districts.

At the same time the company announced an increase of ½ cent a gallon in the retail price on all grades of gasoline, effective for the Pacific Coast area, Alaska and Hawaii.

With the exception of Union Oil Company of California, all other major crude purchasers on the Pacific Coast indicated their intention of following the price changes on both crude oil and gasoline. Union Oil Company on March 22 posted a schedule on crude oil for all fields in which it buys, providing a higher price for most low-gravity crudes and somewhat at variance with Standard Oil Company's postings on high gravities. The March 12 Standard Oil Company posting had placed a top of $1.19 a barrel on the higher gravities in those fields where revisions were made, while Union Oil Company's schedules followed earlier practices of graduating the price differentials on all gravities without a top figure.

Record Refinery Runs Raise Danger Signal

Although the industry's inventory situation remains generally favorable, as evidenced in the statistics covering the week ended April 19, a danger signal appeared in the figures on refinery runs of crude. The runs were increased sharply to an average of 3,705,000 barrels daily, a new all-time high, an expansion of 75,000 barrels over the previous week's daily average. The plants then were processing approximately 4 percent more crude than the daily average of April, last year, which was 3,566,000 barrels.

The plants, nevertheless, did not charge to stills as much crude as the wells currently turned out, production having jumped 149,000 barrels to 3,752,650 barrels daily. The latter figure was about 40,000 barrels in excess of indicated average daily market demand for domestic crude in April. However, production in the two preceding weeks had been less than demand and some crude had been coming out of storage.

Refinery output of gasoline increased in response to the larger runs to stills, having totaled 12,574,000 barrels for the week, or 463,000 barrels more than in the preceding seven days, an increase of about 65,000 barrels in daily production.

Despite the larger current production, however, it was necessary to withdraw 755,000 barrels of gasoline from storage during the week, the stocks having come down from 98,654,000 to 97,899,000 barrels. The latter quantity was 5,723,000 barrels (5.5 percent) smaller than that of 103,622,000 barrels in storage April 19 last year.

Included in these totals are stocks of

Trends of Operations and Changes in Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1938:						
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
December 10	3,245,100	3,150,000	[6]269,509,000	68,687,000	32,068,000	118,711,000
1939:						
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,085,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	[7]25,844,000	[7]108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
August 5	[1]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[8]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[2]3,650,000	[2]229,127,000	72,122,000	39,358,000	115,060,000
1940:						
January 27	3,611,600	3,470,000	237,339,000	87,914,000	27,407,000	103,015,000
February 24	3,732,100	3,450,000	240,836,000	96,719,000	25,390,000	103,419,000
March 30	3,841,250	3,585,000	250,561,000	101,370,000	23,778,000	105,081,000
April 20	3,858,550	3,535,000	254,881,000	[1]102,817,000	24,779,000	103,323,000
April 27	3,845,250	3,555,000	256,670,000	102,452,000	24,997,000	102,552,000
May 25	3,835,650	3,580,000	259,330,000	100,297,000	28,356,000	104,015,000
June 22	3,846,450	[2]3,690,000	260,891,000	97,276,000	32,751,000	104,683,000
June 29	3,639,550	3,625,000	262,059,000	95,142,000	33,590,000	104,486,000
July 27	3,690,400	3,555,000	262,579,000	90,173,000	38,981,000	105,924,000
August 31	3,501,350	3,575,000	265,865,000	85,393,000	44,766,000	108,774,000
September 28	3,799,950	3,600,000	263,609,000	82,273,000	47,986,000	108,450,000
October 26	3,640,300	3,565,000	262,746,000	80,891,000	[1]48,893,000	108,475,000
November 9	3,584,200	3,510,000	261,631,000	[6]79,847,000	48,408,000	107,687,000
November 30	3,335,050	3,510,000	262,679,000	80,284,000	46,212,000	106,618,000
December 28	3,385,500	3,585,000	261,552,000	83,274,000	42,266,000	102,620,000
1941:						
January 25	3,599,100	3,625,000	260,093,000	88,762,000	39,039,000	100,297,000
February 22	3,629,650	3,590,000	261,783,000	95,812,000	34,381,000	98,631,000
March 1	3,632,250	3,585,000	263,176,000	96,917,000	33,725,000	97,510,000
March 29	3,746,550	3,625,000	266,187,000	[2]99,727,000	29,949,000	96,152,000
April 5	3,514,300	3,600,000	265,540,000	99,112,000	28,824,000	95,371,000
April 12	3,603,650	3,630,000	265,160,000	98,654,000	28,381,000	95,471,000
April 19, 1941	3,752,650	[1]3,705,000	.....	97,899,000	28,410,000	95,636,000
April 19, 1940	3,858,550	[8]3,566,000	[4]252,269,000	103,622,000	24,290,000	102,603,000
Change in past year	—2.7%	+3.9%	+5.1%	—5.5%	+17.0%	—6.8%

[1] All time peak. [2] Peak for year. [3] Lowest since April, 1922. [4] Stocks, April 13, 1940.
[5] Lowest since October, 1922, due to shut down of six mid-continent states. [6] Lowest for year.
[7] Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California.
[8] April, 1940, daily average.

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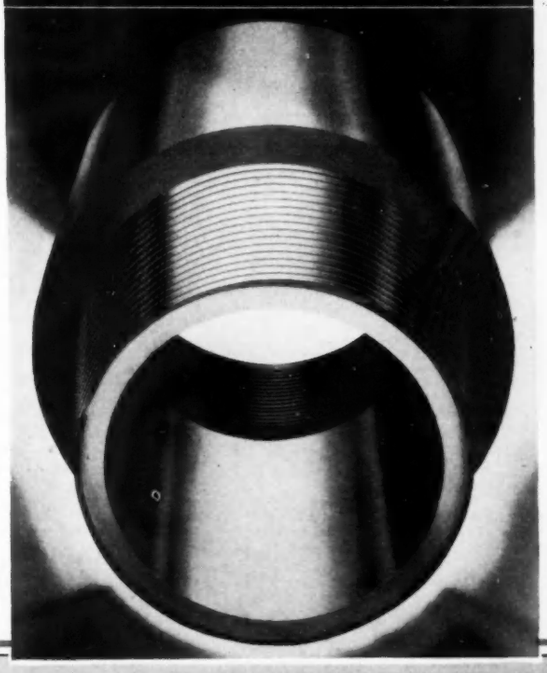

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Wholesale Prices of Refined Products in Principal Markets

	Range Last week (Cents a gal.)		Changes from week Before	
REFINED GASOLINE				
Oklahoma refineries:				
60 Octane and under	4 1/4	4 1/2	+1/4	...
63-66 Octane	4 5/8	4 7/8	+1/4	...
72-74 Octane	5	5 3/8	+1/4	+1/8
Mid-Western Tank Car:				
60 Octane and under	4 1/4	4 1/2	+1/4	...
63-66 Octane	4 5/8	4 7/8	+1/8	...
72-74 Octane	5	5 3/8	...	+1/8
New York Harbor:				
68-70 Octane	6 1/2	6 1/2	+1/4	+1/4
72-74 Octane	6 1/2	7	+1/4	...
Gulf Coast:				
60 Octane unleaded	4 7/8	5 1/8	...	+1/8
65 Octane unleaded	5	5 1/4	...	...
72-74 Octane leaded	5 1/4	5 3/4	—1/4	...
NATURAL GASOLINE				
Grade 26-70:				
F.O.B. Group 3	3 1/4	3 1/4	+1/4	+1/4
F.O.B. Breckenr'ge, Tex.	2 3/4	2 3/4	+1/4	+1/4
KEROSENE				
Oklahoma Refineries:				
41-43 water white	4	4 1/2	...	...
42-44 water white	4 1/4	4 5/8	...	...
Mid-Western Tank Car:				
41-43 water white	4 1/2	4 1/2	...	...
42-44 water white	4 1/4	4 5/8	...	...
New York Harbor	5	5	+1/8	...
RANGE OIL				
At Oklahoma Refineries	3 7/8	4 1/8	...	...
In Mid-Western Market, Group 3, basis	3 7/8	3 7/8	...	...
LIGHT FUEL OILS				
Oklahoma Refineries:				
No. 1 straw	3 3/8	3 3/4	...	...
No. 3	3 1/4	3 3/8	...	...
Mid-Western Tank Car:				
No. 1 white	3 3/4	4	...	...
No. 3	3 1/4	3 3/8	+1/8	...
New York Harbor:				
No. 1	5	5	+1/8	...
No. 3	4 1/2	4 7/8	...	+3/8

	Range Last week (Per Bbl)		Changes from week Before	
HEAVY FUELS				
Oklahoma Refineries:				
No. 6	$0.70	$0.70	...	...
Mid-Western Tank Car:				
No. 5	.75	.85	...	...
No. 6	.70	.75	...	...
New York Harbor:				
No. 5	1.65	1.65	+.10	+.10
No. 6	1.35	1.35	+.10	+.10
BUNKER C FUEL OIL				
(Per barrel, ships' bunkers)				
Gulf Coast	$ .85	$ .90	+.05	...
New York Harbor	1.35	1.35	+.10	+.10
DIESEL OIL				
(Per barrel, ships' bunkers)				
Gulf Coast	$1.45	$1.50	...	...
New York Harbor	1.95	1.95	+.10	+.10
Los Angeles Basin, 27 gravity	1.15	1.20	+.05	...
LUBRICATING OIL				
(Cents a gal.)				
Oklahoma Refineries:				
Bright Stock, 150-160 viscosity at 210°, 10-25 pour test	14	15 1/2	...	...
Neutral oil, pale No. 3 color, 150 viscosity at 100°, 0-10 pour test	8	10 1/4	...	...
Western Pennsylvania:				
Bright Stock, 145-155 viscosity at 210°, 25 pour test	16	17	...	...
Neutral Oil No. 3 color, 150 viscosity at 70°, 25 pour test	22	23	—1	—1

aviation gasoline, which are 1,805,000 barrels larger now than a year ago, having totaled 6,839,000 barrels April 19. Deduction of the aviation grade indicates that present stocks of ordinary gasoline are 7,528,000 barrels (7.6 percent) smaller than those held at this time last year, totaling only 91,060,000 barrels, against 98,588,000.

Crude oil stocks declined in the week ended April 12 from 265,540,000 to 265,160,000 barrels, the United States Bureau of Mines reported.

Production Slips 23,775 Barrels; Stays Above Demand

United States crude oil production averaged 3,724,575 barrels during last week. That was 23,775 barrels less than output of the previous week, and 15,275 barrels more than market demand in April, as estimated by the Bureau of Mines.

The decrease reflected declines in Texas, California, Louisiana and Kansas that outweighed increases in Oklahoma, Illinois and Mississippi.

Texas last week averaged 1,395,900 barrels daily, which was 2800 barrels less than in the previous week. Daily output last week and changes from the preceding week in other producing states included: California, 605,900 barrels, down 20,400; Oklahoma, 415,075 barrels, up 1275; Illinois, 327,000 barrels, up 2200; Louisiana, 305,700 barrels, down 2600; Kansas, 213,400 barrels, down 5100, and New Mexico, 109,100 barrels, up 100.

California Responsible for Production Decline

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (April)	State Allowable (Barrels Daily in April)	BARRELS DAILY FOR WEEK ENDED April 19	April 26
TEXAS—				
Texas Panhandle	.....	.....	80,200	80,750
North Texas	.....	.....	100,900	100,000
West Central Texas	.....	.....	30,500	30,350
West Texas	.....	.....	250,800	248,700
East Central Texas	.....	.....	79,600	76,950
East Texas Field	.....	.....	374,500	374,550
South Texas	.....	.....	210,400	210,150
Texas Gulf Coast	.....	.....	271,800	274,450
Total Texas	1,355,300	1,325,291*	1,398,700	1,395,900
CALIFORNIA—				
Long Beach	.....	.....	42,400	42,100
Midway-Sunset	.....	.....	48,800	40,800
Kettleman Hills	.....	.....	38,900	37,900
Wilmington	.....	.....	82,000	82,200
Others	.....	.....	414,200	402,900
Total California	596,300	571,500†	626,300	605,900
OKLAHOMA—				
Oklahoma City	.....	.....	93,550	88,900
Seminole Area	.....	.....	108,760	111,050
Others	.....	.....	211,490	215,125
Total Oklahoma	429,300	400,000	413,800	415,075
ILLINOIS—				
Salem	.....	.....	97,400	97,200
Louden	.....	.....	67,300	67,800
Centralia	.....	.....	11,500	10,900
Other New Pools	.....	.....	137,700	139,900
Old Pools	.....	.....	10,900	11,200
Total Illinois	336,000	.....	324,800	327,000

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (April)	State Allowable (Barrels Daily in April)	BARRELS DAILY FOR WEEK ENDED April 19	April 26
LOUISIANA—				
North Louisiana	.....	.....	70,500	70,200
South Louisiana	.....	.....	237,800	235,500
Total Louisiana	299,700	300,893	308,300	305,700
KANSAS	200,700	210,700	218,500	213,400
NEW MEXICO	109,000	110,000	109,000	109,100
EASTERN STATES—				
Pennsylvania Grade	49,000	.....	70,500	73,800
Others, Eastern	51,700	.....	21,100	19,500
Total Eastern States	100,700	.....	91,600	93,300
MOUNTAIN STATES—				
Wyoming	88,700	.....	78,500	79,400
Montana	21,300	.....	19,500	19,800
Colorado	4,300	.....	3,800	3,900
Total Mountain States	114,300	.....	101,800	103,100
MICHIGAN	44,000	38,000‡	37,100	37,200
INDIANA	23,700	.....	21,500	20,100
ARKANSAS	75,700	72,024	71,800	71,800
MISSISSIPPI	20,300	.....	20,800	22,800
NEBRASKA	4,300	.....	4,350	4,200
§Total 8 Prorated States	3,110,000	3,028,408	3,183,500†	3,154,075
Total United States	3,709,300	.....	3,748,350	3,724,575

† Recommendation of Conservation Committee of California Oil Producers.
‡ Estimate of actual production under prescribed regulations, which do not fix a definite state total allowable.
§ Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Arkansas, Michigan.
* Texas Railroad Commission's estimate of actual net daily production allowing for usual under-production of 3½ percent under net allowable, which at the beginning of April is calculated at 1,373,359 barrels daily. However, allowable normally increases as new wells are completed. Under April order, most Texas fields were ordered shut down April 5, 6, 9, 12, 13, 19, 20, 26, 27 and 30. Texas Panhandle was ordered shut down April 6, 13, 26 and 30.

WORLD-WIDE DEVELOPMENTS

Britain Moves Promptly To Protect Iraq Oil Supply

That the British do not intend to let control of the Iraq oil fields go by default is evident in the recent landing of "strong" military forces at Basra, Iraq port on the Persian Gulf. This was Britain's prompt answer to the overturn in the Iraq government which resulted in seizure of the premiership by a group generally considered hostile to the British and possibly favorable to Axis powers.

On the unannounced arrival of the British forces at Basra the new premier sent a staff officer to greet the leaders and prevent an "incident" developing between the British and the local shore batteries. London has not recognized the new Iraq government. The general impression is that Britain, by strengthening her forces at strategic points in Iraq, has determined to guard against seizure of the oil properties either by domestic groups or the familiar class known as "tourists."

Britain is apparently drawing heavily on the oil of Iraq in the conduct of the war. All indications are that the Axis forces have Iraq as one of their important objectives in the drive against the Suez Canal and the battle to force the British from Greece.

Mexican Imports Under Trade Agreement Halt for the Year

Entry of crude oil, topped crude and fuel oil from Mexico at the reduced excise tax rate provided for in the Venezuelan reciprocal trade agreement came to a halt for the current year during the week ended April 5, it was announced last week by the Treasury Department.

Preliminary reports from collectors of customs indicated that the Mexican quota of 138,587,400 gallons had been reached early in April. Those imports or withdrawals from warehouse, it was pointed out, were admitted at a tax rate of ¼ cent per gallon, but future imports will be assessed the full rate of ½ cent.

The department gave no figures on imports from other agreement countries, but it was indicated that Venezuela, Netherlands and Columbia had not shipped in their quotas as yet.

Under the proclamation issued by President Roosevelt December 31, the 5 percent of the total quantity refined in the continental United States which may be imported at the reduced tax was divided among the agreement countries in the proportion of 70.4 percent to Venezuela, 21.3 percent to the Netherlands and its overseas territory, 3.2 percent to Colombia and 5.1 percent to other foreign countries, including Mexico.

More Restrictions Imposed On Export of Technical Data

A further tightening of control of exports of oil field and refining equipment from the United States is seen in recently announced Export Control Schedule A. Licenses are required to export "Any model, photograph, photographic negative, document or other article or material, containing a plan, specification, or descriptive or technical information of any kind (other than that appearing generally in a form available to the public) which can be used or adapted for use in connection with any process, synthesis or operation in the production, manufacture or reconstruction of any of the articles or materials the exportation of which is prohibited or curtailed in accordance with the provisions of Section 6 of the Act of Congress approved July 2, 1940, or of any basic or intermediary constituent of any such articles or materials."

Technical data pertaining to aviation fuel and lubricating oil had previously been subjected to license requirements. The latest action extends export control to technical data relating to articles, materials and their derivatives that are themselves subject to license.

The license requirement does not apply to "Information which has been made available generally to the public as issued patents, copyrighted articles, materials which have been available to the public through technical or other periodicals."

Peruvian Refinery Will Have 10,000 Barrels Capacity

A Peruvian government refinery with daily capacity of 10,000 barrels is near completion at Villar. Oil for the plant will be taken from government wells, although royalty oil produced by Lobitos Petroleum Company will also be run.

Peruvian oil production in 1940 was approximately 13,420,00 barrels, compared to 13,510,000 barrels produced in 1939. Chief war losses of the Peruvian industry have been in the markets of France, United Kingdom and Germany, but exports to Chile, Canal Zone and Japan rose last year. Japan's takings were largely crude rather than refined oils.

In 1940 as a result of successful exploration work by Blue Goose Oil Company on the Agua Caliente concession, upper Ucayali valley, the government issued a resolution reserving the petroleum rights in the zone bounded by parallels 6 and 8 of south latitude, the Ucayali river on the west and the Brazialian line on the east. Government explorations at Cope met with some success.

Houston Nomad Chapter Plans Golf Tournament

A golf tournament, cocktail party and chicken barbecue will be given by the Houston Chapter of Nomads to members and guests at the Braeburn Country Club on May 12. Gordon Richmond is chairman of the general entertainment committee with T. Campbell and Joe McEvoy serving on the committee with him. Frank Champion, president of the Houston chapter, is chairman of the golf committee. A large crowd, consisting of Nomads, foreign oil men visiting in Houston, and Houston oil men, many of whom have seen service abroad, will be present.

Creole Report Reviews Operations in Venezuela

Considerable detail relating to operations of the Standard Oil Company of Venezuela during 1940 is presented in the annual report of Creole Petroleum Corporation, which controls that company. Net production and purchased royalty oil totaled 33,641,737 barrels, as compared to 35,386,383 barrels in 1939. Last year Quiriquire production, 21,676,451 barrels, led the output of fields. Jusepin and the Lake Parcels area were second and third in production with 3,995,154 and 3,165,666 barrels respectively. Ofiicina field production began moving through the 16-inch line to Guanta early in 1940. The same line began carrying oil from San Joaquin district in midyear.

Standard Oil Company of Venezuela operated an average of 10.9 rigs on partly or wholly owned property, of which 1.7 rigs were on exploratory wells. The rigs drilled 231,242 feet of new hole compared to a footage of 348,365 in 1939. Fifty-five exploitation and four exploratory wells were completed on property in which the company had an interest, the net interest being 42.5 exploitation wells and 1.2 exploratory wells.

Two wildcats were drilled at Socororo, 22 miles west of Oficina, of which one was a minor producer and the other a dry hole. A third failure was completed early this year. In central Venezuela, Gorrin 1, a wildcat 160 miles west of Socororo, was dry. Another wildcat at Las Ollas was drilling below 6800 feet in December. In the Leona area a 1000-barrel well was completed, producing 26.5-gravity oil.

Thirty-six producers were completed in the Jusepin field. Eight wells, all producers, were completed in the San Joaquin district, which includes the Roble and Santa Ana wells. At Oficina, 9 wells were completed on company lands adjoining the field. One producer was completed at Cumarebo. A dry hole was drilled in the Temblador area. No drilling occurred in the Lake Parcels or the Pedernales field.

To date Standard Oil Company of Venezuela's total record in Venezuela has been 951 wells completed on property in which the company holds an interest. Of the total the company's net interest amounted to 704 wells—566 oil wells, 129 dry holes and 9 gas wells.

On December 31, 1940, the company's net equity in petroleum concessions in Venezuela totaled 4,711,376 acres. Acquisitions during the year amounted to 102,433 acres, of which 2583 were obtained from the government under the acreage transaction negotiated in August, 1936. No concessions were applied for under the 1938 petroleum law. A total of 271,955 acres was relinquished as unpromising.

Four-inch and eight-inch gathering lines were laid from the Roble and San Joaquin wells to the Anaco tank farm, where connection is made with the pipe line from Oficina to Puerta la Cruz. Oil facilities at the terminal at Caripito were improved by construction of a 116,000-barrel tank.

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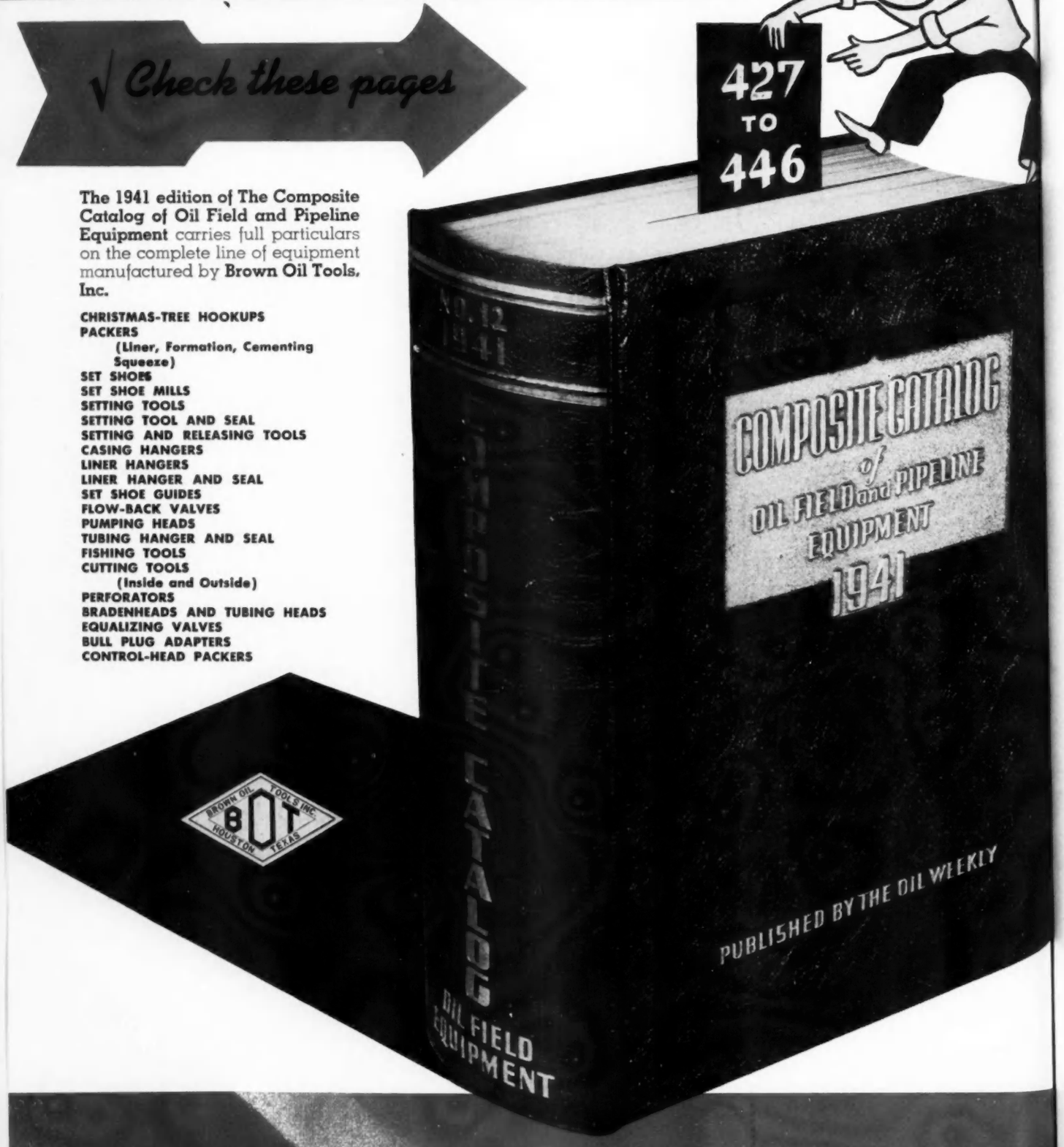

BROWN OIL TOOLS, INC., HOUSTON, TEXAS

Illinois-Indiana

Strikes in Wayne, White And Wabash Counties

A Wayne County wildcat a mile from production was rated at 2400 barrels a day from McClosky lime after it began flowing while the swab was being run. It has not been acidized, and was producing from pay at 3012-27 feet. The well, about equal distance from three fields, is John Sanders' Leslie Hubble 1, Section 30-2n-8e, Zif township. Some operators regard the test as an extension to one of the nearby fields, but others believe it will open a new area.

Another field has been opened in White County where Cherry-Kidd's Karsch 1, SW NW NE 24-6s-10e, 11 miles southeast of Carmi, flowed by heads from Aux Vases sand at 2841 feet. Hole was being cleaned out to install pump. At an elevation of 373 feet, Karsh 1 topped Palestine at 1997 feet, Cypress at 2555 feet, and Benoist at 2691 feet. In addition to the Aux Vases, it found saturation in the Palestine at 1998 feet and in the Cypress at 2555 feet.

A new Wabash County field was opened with completion of R. S. Hay & F. H. Brown's Lew Seiler 1, SW SE NW 30-1s-12w, a mile southwest of Mt. Carmel, which pumped 112 barrels initially from Tar Springs sand at 1784-90 feet following a plug-back from McClosky lime, which was unsuccessfully tested. A west offset was being started, Hays-Yingling Lavender's Anna Gallatin 1, SE SW NW 30-1s-12w.

An Edwards County wildcat, Tide Water Associated Oil Company's R. P. Lester 1, NW SW SW 19-2s-10e, five miles west of the Albion field, cored Aux Vases pay at 3336-57 feet, and a drill-stem test was to be made to determine whether casing should be cemented or the hole drilled on to the McClosky.

A Shelby County pool opener, Hinkle & Sloan's Harrison 1, 10 miles southwest of Shelbyville, SE NE 12-10n-2e, pumped 76 barrels of oil and 19 barrels of water in 48 hours from Aux Vases sand at 1725-34 feet. Elevation is 620 feet, and Glen Dean was topped at 1436 feet.

Benton Leasing Trouble

W. O. Morgan's Minier 2, NE NW NE 36-6s-2e, offset to Minier 1 which extended the Benton field of Franklin County 1½ miles south, was flowing about 1200 barrels a day, according to the operator, from Tar Springs sand. Minier 1 came in with a flow of 40 barrels an hour, largest production ever obtained from a Franklin County well previous to completion of Minier 2. Activity in the Benton field is being hampered to some extent by a series of lawsuits evolving from claims to mineral deeds in the area. Much of the oil acreage was leased years ago for coal exploration, and now both coal companies and fee owners are claiming oil rights. It is probable that two or more of the cases will go to the state supreme court. Meanwhile, some farmers in the field are patrolling their land with shotguns to prevent operators holding leases from coal companies to drill on the land.

A Williamson County wildcat, Sun Oil Company's Old Ben Coal Company 1, NE NE NW 13-8s-2e, was abandoned at 2780 feet through the McClosky. An oil stain in the Aux Vases was tested, but showed very little oil and water.

South 1½ miles of Jefferson County's Dix field, discovered in 1937 by The Carter Oil Company, C. O. Sargent 1, drilled by a group of independents, Section 22-1s-2e, was shut down on orders after electric log revealed six feet of saturation in Benoist sand at 1931-37 feet. Operators were deciding whether to set casing.

An important Marion County wildcat, Swan-King Oil Company's Martin's cemetery 1, SW SE SW 36-4n-2e, near Alma, was drilling at 2055 feet for the McClosky after finding salt water in the Benoist sand, topped at 1995 feet. It was reported there was a trace of oil in the top of the Benoist. Derrick was being erected for a new Marion County wildcat a mile east of Odin and about two miles west of production in the Salem field, Hudson-Hess' Ben Young 1, SW SW SW 7-2n-2e.

In the Salem field The Texas Company was completing one of the best Trenton producers yet drilled there, Wyman 22, which was being cleaned out after swabbing and flowing 300 barrels of oil in 24 hours from 4625 feet. It is in the NE NE 31-2n-2e, and was deepened from the Devonian. The field's north Devonian outpost, Ladd Oil Company's Young Church 4, Section 21-2n-2e, was still being tested, and in one recent test it pumped but seven barrels in 24 hours from 4665 feet.

A new Clinton County wildcat, Benoist's Custis 1, NE SW NE 18-1n-2w, 12 miles west of Centralia, was shut down at 470 feet after tools were stuck in the hole. It is being drilled with a portable rotary. Other highlight of the week in Clinton County was the fifth anniversary of the Bartelso field's discovery. The field was the first opened in Illinois' new development although discoveries a few months later at Patoka in Marion County and Clay City in Clay County are generally credited with launching the resurrection of the state's oil industry.

A Hamilton County wildcat three miles south of the Hoodville field, Youngblood's Johnson 1, SE NW NE 27-6s-6e, was drilling for the Cypress after a promising Tar Springs show proved disappointing on a drill-stem test. About four feet of Tar Springs was drilled before coring started. Eight feet of an 18-foot core were recovered and appeared to be well saturated, but on a drill-stem test salt water showed.

In the New Haven field of White County, Benedum-Trees' Vail 2, NE NW SE 19-7s-11e, the pool's first Cypress producer, was showing for a 50-barrel well from 2457 feet. The same operator's Stinson 3, the field's first Hardinsburg sand producer, SE SE NW 19-7s-11e, was showing for an 80-barrel well after operators succeeded in straightening casing which was twisted by a shot.

Two Saline County wildcats were being started. Thompson Drilling Company's Carter 1, NW 16-8s-6e, at the edge of Eldorado, was to be spudded immediately. L. J. Holland et al's Hugh Roberts 1, SW SW 6-8s-6e, was rigging up tools.

Lease Expirations May Force Wildcat Drilling

In southwestern Indiana, particularly in Posey County, five-year leases on large blocks of untested acreage are to expire this summer and fall, and reports persist of a wave of new wildcat drilling.

Posey County's latest wildcat, Gulf Refining Company's Aldrich Communitized 1, SE NE SE 8-6s-14w, in Lynn Township, apparently was a failure at 3106 feet. Test was inactive pending orders. No commercial shows were reported in any horizon. Starting at surface elevation of 434 feet, Glen Dean was topped at 2386 feet, Hardinsburg at 2400 feet, Golconda at 2471 feet, Barlow at 2596 feet, Upper Cypress at 2614 feet, Bethel at 2783 feet, and Aux Vases at 2909 feet.

Also abandoned, dry through the Tar Springs at 2920 feet, was a Vanderburgh County wildcat east of Posey County line, Illind Oil Company's Fredericka Hendricks 1, SE SW SE 31-6s-11w.

Drilling at 1300 feet was a new start in the Heusler Dome field of southwest Posey County, R. B. Creager's Dr. Welborn 1 Sun Oil Company farmout 660 feet north of Harris-Stuart's Welborn-Strueh 1, recent Tar Springs sand completion.

Still testing McClosky lime after efforts to shut off water was W. C. McBride, Inc.'s Jesse Blood 1, SE SE NE 28-3s-14w, on the west edge of present production in the Griffin field of Gibson County. Same operators located Blood 2, one location north.

Northeast of Sandborn, in the southwest corner of Greene County, Midwest Development Company was drilling with cable tools at 1200 feet in C. Good 1, NW NW 21-6n-7w, wildcat several miles from production. Mississippi lime was topped at 909 feet.

In Pike County, Jefferson Township, near Iva, Southwestern Development Company's Doads 1, SE SE SW 19-1n-6w, was a gas well completion in the Hardinsburg sand at 1714-18 feet, estimated to have initialed 600,000 feet daily.

Coring Cypress sand was a Posey County wildcat in Point Township, Johnson Oil & Refining Company's John W. Spencer 1, SE SE SE 26-7s-14w. This test, 330 feet south of a dry hole, started at surface elevation of 363 feet, and topped Mansfield sand at 1285 feet.

Oklahoma-Kansas

Pottawatomie County Strike Brings Five Offset Tests

Five offsets have been started around Hall-Jordan Oil Company's Whitehead 1, C W½ SE SW 36-10n-3e, between Shawnee and Tecumseh, Pottawatomie County, which established a flowing potential of 4074 barrels daily through casing. First hour flow gauged 240 barrels, second hour 165 barrels, third hour 136 barrels and fourth hour 138 barrels. Pipe line connection by Stanolind Pipe Line Company has been completed, and tubing has been run in the discovery. Gas volume is estimated at 4,000,000 feet. Operators staked Pensoneau 1, SEc SW 36-10n-3e, a west offset on an Ohio Oil Company farmout; Blain 1, NE NW NW 1-9n-3e, a southwest diagonal offset, and Whitehead 2, SW SE SW 36-10n-3e, a south offset. Phillips Petroleum Company spudded Luttrell 1, NEc NW 1-9n-3e, south of the discovery, and Gulf Oil Corporation staked Dixon 1, SE NW SW 36-10n-3e, a northwest diagonal offset.

Whitehead 1 logged Earlsboro sand at 4340-60 feet for a show of gas, Misener sand at 5008-5015 feet for a show of oil and gas, Hunton 5015-5122 feet, Viola 5118 feet, Sylvan 5122 feet, Dense 5157 feet, Dolomite 5189 feet, and topped Wilcox sand at 5234 feet. Core analysis at 5234-45 feet revealed saturation of 16 percent, porosity of 16½ percent and gravity of 40.3 degrees.

Eason Oil Company and Grisso Royalty Company opened a gas area two miles southwest of West Asher pool, Pottawatomie County, at Royster 1, SW NW NW 33-6n-3e, completed for 3,540,000 feet per day. Casing pressure was 1500 pounds, and no pipe line outlet has been secured. Belle City lime was topped at 2459 feet, Hogshooter 2804 feet, Layton 2871 feet, Checkerboard 3035 feet, Wanetle sand 3619 feet, unconformity zone 3664 feet, Horrigon lime 3699 feet, and hole was drilled to 3753 feet. Hole was plugged back to 2835 feet, cement drilled out to 2894 feet in Layton sand and perforated with 12 holes at 2869-78 feet.

New Gas Area Indicated

Mico Oil & Gas Company's Davis 1, NEc 3-10n-8e, between South Cromwell and Bethel pools, Seminole County, blew in with 15,000,000 feet daily, but dropped to 5,000,000 feet daily in 12 hours, when plugs were drilled in Cromwell sand at 3503-13 feet. A large spray of salt water accompanied the gas flow. Operators were testing. Electric log marked Calvin at 1768 feet, Booch 3062 feet, Gilcrease 3297 feet, and Union Valley 3489-3510½ feet. Sample top of Cromwell sand was set at 3503 feet. Five and one-half casing was cemented at 3488 feet.

Gardner Petroleum Company, Summit Drilling Company and Olean Petroleum Company's Lowry 2, C N½ SE SW 12-19n-1w, semi-wildcat north of an abandoned producer and four miles east of Orlando pool, Payne County, filled 3500 feet with crude over night when plugs were drilled out in Misener sand at 4720-47 feet. Crude tested 41-gravity. Operators have run tubing, and will test.

A new deep sand pay for shallow Harness gas field, Grady County, was indicated at W. H. Atkinson et al's Jelks 1, NEc SE 22-5n-7w, nine miles south of Chickasha. Originally contracted to 4000 feet, operators deepened from 4005 feet and topped a sand at 4360 feet. Core recovery at 4365-75 feet showed five feet of fully saturated sand, four feet of stained conglomerate and one foot of shale. New contract depth is 5000 feet, and bit was seeking the Charlson zone, prolific gas body of the Chickasha gas field.

One mile north of West Doyle pool, Stephens County, Phillips Petroleum Company and Helmerich & Payne, Inc. spudded Cryer 1, SE NE SW 33-2n-5w, a contracted wildcat to Deese sand or 6000 feet.

F. E. Weimer, Carl B. King, Kirk S. White and Harry Wirick's Williams 1, NE NW SW 16-12n-10e, two miles north of Cary pool, Okfuskee County, was checking structurally high after missing both Gilcrease and Cromwell sand sections. Pitkin lime was topped at 3100 feet, and a small section of Wapanucka lime at 3085-94 feet showed good saturation. Operators are seeking Hunton lime pay below the Mississippi and Caney lime sections.

C. S. Miller et al extended Kasishke pool, Osage County, ½ mile northeast at Osage 2, SW NE SW NE 18-24n-8e, which flowed 100 barrels of high-gravity crude by heads in 3½ hours through casing. Pay is Hominy-Wilcox sand at 2796-98 feet. This semi-wildcat logged Big lime at 1999-2058 feet, Oswego 2161-2210 feet, Pink lime 2377-86 feet, Mississippi Chat 2523-36 feet, and trace Mississippi lime 2536 feet. When plugs were knocked out, hole immediately filled with oil and flowed.

Stanolind Oil & Gas Company and Guy Hannum et al's Little 1, C E½ NE SE 16-3n-1e, a mile west of Pauls Valley, Garvin County, topped Arbuckle lime at 4590 feet and penetrated to 4866 feet before running electric log. Hole was abandoned when log showed water in the Arbuckle.

Eagle Oil Company's Mann 1, SW NE NE 31-7n-7e, wildcat south of Little River pool, Seminole County, was awaiting retardation of water from Little River, which rose five feet over the well following a heavy rain. Previously, the test headed a strong flow of oil and was shut in on top of 10-inch surface pipe. Pay is Upper Senora sand at 2010-18 feet.

Extensions Given Ainsworth And Greenvale Pools

Continental Oil Company extended production in Ainsworth pool, Barton County, ¾ mile northwest at Stoskopf 1, SE NW SW 28-16-13w, establishing a potential of 539 barrels per day. Arbuckle dolomite was penetrated to 3403 feet.

The Texas Company extended Greenvale pool west at Borrell 1, C N½ NE SE 32-14n-12w, pumping 117 barrels net oil in 10 hours and completed on later tests for 65 barrels daily. Arbuckle dolomite was logged at 3164-71 feet and treated with 1000 gallons of acid. This test is ½ mile southwest of Northwest Greenvale pool, Russell County, which is productive in Lansing-Kansas City lime. North Greenvale pool produces from Howard lime, and Greenvale pool proper has pay in both Arbuckle and Lansing-Kansas City limes.

Twenty-five miles north of Ray pool, Phillips County, and 15 miles north of Van Patton pool, Norton County, Barnsdall Oil Company and Helmerich & Payne, Inc. plugged Rumsey 1, C NE NW 35-1s-21w, wildcat immediately south of the Nebraska state line. Log revealed Anhydrite topped at 1890 feet, Topeka 3285 feet, Kansas City-Lansing 3490 feet, and Arbuckle lime at 3752 feet. Hole was bottomed at 3800 feet, with no shows encountered throughout the section.

Wildcats in Saline, Barton and Ellsworth counties were abandoned. Rocket Drilling Company et al's King 1, C S½ SW SW 29-15-1w, nine miles north of Roxbury pool, Saline County, was plugged in Mississippi Chat at 2672-2723 feet with only a small show of gas. Vernon Oil & Gas Company et al's Popp 1, NE SE NW 15-16-14w, 1⅝ miles southwest of Trapp pool, Barton County, was plugged at 3420 feet in dry Arbuckle dolomite topped at 3370 feet. Upper log disclosed Anhydrite topped at 867 feet, Ft. Riley 1845 feet, Neva 2190 feet, Topeka 2820 feet, and Lansing 3125 feet. Northwest of Lorraine pool 1½ miles, Ellsworth County, Phillips Petroleum Company's Rolfs 1, C S½ SE NW 10-17-9w, was dry in Arbuckle dolomite at 3426-42 feet. Nine miles northeast of Iuka pool, George Reeves et al's Stark 1, C W½ SW NW 18-26-11w, Pratt County, was dry in Simpson sand, and Arbuckle dolomite and plugged back to 4150 feet to test Viola lime at 4123-4200 feet.

Aladdin Petroleum Corporation cemented 5-inch pipe at 3185 feet at Westerfield 1, NE SW NW 3-32-8e, three miles east of Reidy pool, Chautauqua County. Hole filled with water at 2800-15 feet in Mississippi lime, topped at 2715 feet.

Tulsa Oil Corporation and Continental Oil Company completed a new pool opener in Cowley County. Miller 1, SW SE NE 15-32-5e, a mile northeast of Frog Hollow pool, pumped 40 barrels of oil and eight barrels of water in 24 hours from Bartlesville sand, shot with 50 quarts at 3070-3105 feet.

Nebraska-Iowa

Richardson Wildcat Has Light Production from Hunton Lime

National Petroleum Company's Oswald 1, C NW SW 15-2n-14e, Richardson County wildcat, northwest of Falls City pool, topped Hunton lime at 2551 feet, and shot with 10 quarts at 2558 feet. Following another 10-quart shot at 2573 feet, it was estimated at 25 barrels daily. Hole was bottomed at 2584 feet, and lime section was previously treated with 2200 gallons of acid and 500 gallons of butane.

Seven miles southeast of Auburn, Nemaha County, Nebraska, Phillips Petroleum Company's Neil 1, C SW NE 24-4n-14e, will be plugged at 2930 feet. Top of Topeka lime was at 720 feet, Lansing 1060 feet, base Kansas City 1315 feet, top Cherokee 1540 feet, and Mississippi lime at 2245 feet.

Black Gold Operating Company located Watkins 1, C SE SE 30-3n-16e, one location west of production in Shubert pool and ¾ mile from a recent

discovery to the west. It is a farmout from The Ohio Oil Company.

The Ohio Oil Company's Wisnom 1, C NW NE 23-68n-41w, wildcat in Fremont County, Iowa, topped Viola lime at 2480 feet, and was rotating below 2950 feet with St. Peter sand the objective. Pryor & Lockhart and Stanolind Oil & Gas Company's Marr Estate 1, C E½ NE SW 32-68n-33w, Iowa wildcat, logged Hunton around 1700 feet, and was drilling below 2475 feet.

The Ohio Oil Company moved in rig for Seibbernsen 1, C W½ SW SE SW 17-1n-16e, Falls City pool. Same operator had a failure between producers in the area at Bucholtz 4, C SW NW 17-1n-16e, which swabbed 45 barrels of fluid per hour, 5 percent oil and remainder water. Hunton lime was logged at 2300-03 feet, and treated with 300 gallons of acid.

Zimmer et al's Roddy Estate 1, C S½ SE SW 31-9n-14e, Otoe County, topped Mississippi lime at 1050 feet, Hunton 1608 feet, Maquoketa shale 1905 feet, Viola lime 1936 feet, and was drilling around 2375 feet. Walter Rider et al's Warren 1, C NE NE 21-3n-5e, Gage County wildcat, topped Kansas City lime at 1202 feet. Bit was below 1475 feet. A small show of oil were encountered in Tarkio and Topeka limes.

In the Oskaloosa area of Jefferson and Leavenworth counties, Dan McLaughlin et al were drilling below 1400 feet in C NE NW 3-10s-20e, Northeastern Kansas sector of Forest City Basin.

Continental Petroleum Company of Nebraska et al's Gauchat 1, SW NW NE 26-6n-13e, six miles northwest of Auburn, Nemaha County, based Mississippi lime at 1790 feet, and was below 2200 feet.

Montana

Montana Deep Test Has Bearing on Dakota Prospect

Contract has been let by The Carter Oil Company for a 10,000-foot test for oil in the Cedar Creek gas field, on the Baker-Glendive anticline, Fallon County, Eastern Montana. Nobel Drilling Company, Tulsa, the contractor, is moving in heavy rotary equipment to drill Unit 1, C SW SE 19-4n-62e, the location following a detailed geophysical study of 120,000 acres which The Carter Oil Company recently acquired under contract from Fidelity Gas Company for deep-oil development. Under this contract, The Carter Oil Company is to bear all expense of the development and pay Fidelity Gas Company 25 percent of proceeds of deep production.

The contracted depth will set a new record for Montana. But more important will be its bearing on the future of wildcat effort in North Dakota and South Dakota where heavy leasing has been under way during the past 18 months. This leasing has involved 3,500,000 acres taken by The Carter Oil Company, The Ohio Oil Company, Yale Oil Company, Amerada Petroleum Corporation, Gulf Oil Corporation, Stanolind Oil & Gas Company, The Texas Company, Continental Oil Company, The Pure Oil Company, Magnolia Petroleum Company, Phillips Petroleum Company, Skelly Oil Company, Mid-Continent Petroleum Corporation, Sun Oil Company, Shell Oil Company, Sinclair Prairie Oil Company and others.

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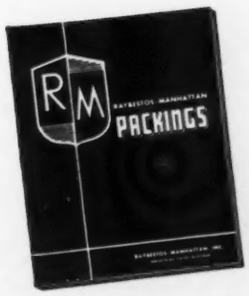

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North and West Texas

Shipley Silurian Producer Makes 75 Barrels Hour

Natural flow of 75 barrels of oil hourly was recorded by Gulf Oil Corporation's Wristen 6, ¼ mile east offset to its Silurian pay discovery completed last December near regular Permian production in the Shipley pool, eastern Ward County. These are the only wells in Texas that produce from the Silurian, which overlies the Simpson, or Middle Ordovician, in this area, but is rarely present in the state. The above flow represents a two-hour gauge taken late in the week while the well was cleaning itself through open tubing with the aid of three million cubic feet of gas daily. Production is from porous limestone at 7022-62 feet, with the hole bottomed at 7080 feet. Top of the Silurian white crystalline lime was called at 6927 feet with an elevation of 2498 feet. Being flat with the discovery which flowed 3049 barrels of 32-gravity oil and 3,500,000 feet of gas initial after using acid in pay at 7010-60 feet. The latter was plugged back after losing junk when attempting to test promising saturation in the Ellenberger section at 9002-9187 feet.

Gulf Oil Corporation's Wristen lease involves a total of 9015 acres. Substantial cash bonuses have been paid by other companies for close-in leases in expectation that the Silurian production will embrace a considerable area.

Production from the Tubb lime horizon, deepest producing zone in the Permian series, is in prospect for the east portion of the Abell field, northern Pecos County. Stanolind Oil & Gas Company's Conry-Davis 1, four miles southeast of the Simpson discovery, yielded 950 feet of sulphur oil and small gas flow when tester was used at 3746-3817 feet. Bottom-hole pressure was calculated at 2580 pounds. Drilling was resumed to continue to the Ordovician.

Fourteen rotary rigs are active in the Abell area, with derrick up on two sites, while the latest location involves Magnolia Petroleum Company's Silverman 1, ¼ mile southwest of the discovery. The latter company's Crockett 1 was drilling plugs from 7-inch pipe at 5300 feet, being about 2 feet in the pay. Top of Simpson was called at 4755 feet and Tulip Creek at 5000 feet, with an elevation of 2390 feet. Its Markey 1-B, northwest offset to the discovery, entered Simpson at 4834 feet, and was drilling at 5060 feet. Construction work on Magnolia Petroleum Company's 80,000-barrel storage in the field has been delayed by inclement weather, and it may not be completed until mid May. In the meantime the allowable of its three wells and that of Phillips Petroleum Company is being delivered by trucks to Magnolia Pipe Line Company's Halley station, Winkler County, a distance of 54 miles.

Gulf Oil Corporation's University 1-F, Crane County wildcat, drilled plugs from 7-inch pipe at 10,610 feet, and was unloading hole to make initial test of oil saturation at 10,658 feet. It is about 30 feet in Ellenberger dolomite.

West Central Andrews County has been assigned a projected deep test to be drilled by Magnolia Petroleum Company on its Ralph lease, PSL Section 20, Block 38. Frank S. Perkins et al completed a 8012-foot failure in the southwest corner of the county in 1938, and 8900 acres around this test was acquired by Magnolia Petroleum Company early this year. Phillips Petroleum Company's University-Andrews 1, northeast outpost for the Embar pool, was drilling lime at 7300 feet and will probably continue to the lime beds that carried nominal saturation in the above deep failure.

Magnolia Petroleum Company's Teague 1, Martin County wildcat, was drilling lime at 7620 feet in Lower Permian. Top of Clear Fork, or Holt, was called at 6100 feet.

Different Stratigraphic Conditions in Montague Strike

Montague County has an oil strike in the making from conglomerate beds near base of Pennsylvanian that involves stratigraphic conditions different from other deep producing areas in the county. The discovery was made by Sinclair Prairie Oil Company's Clingingsmith 1, SWc Block 149, J. Olibarri Survey, 4 miles southwest of Nocona, which flowed oil and gas through tester used in coarse conglomerate at 6119-31 feet, with 2100 pounds bottom-hole pressure. Testing was resumed late last week after cementing 7-inch pipe at 6119 feet. The company holds lease on a large supporting block, with W. L. Kistler, Inc., W. L. Stewart and Westbrook Oil Company each holding single close-in tracts. The prospect is 2½ miles southwest of nearest production in the Rogers & Rogers pool, which produces from two Strawn zones and the Bend 5200-foot conglomerate. Clingingsmith 1 logged base of Palo Pinto and top of Strawn at 3130 feet and top of Bend at 5662 feet, with an unidentified lime at 5918 feet. It is on a fold that parallels the Bend conglomerate trend that has accounted for Bonita, Benton, Rogers & Rogers, Ringgold and Hapgood. However, formations dip sharply immediately south of the Rogers & Rogers area, which normally accounts for 125 to 175 feet of Bend section overlying the Ellenberger. Ramsey Petroleum Corporation's Loring 1, south offset to the most southerly Bend producer in the Rogers & Rogers area, established the syncline condition in logging top of Bend at 5698 feet followed by Mississippian at 6228 feet and Viola (upper Ordovician) at 6421 feet. It was abandoned in Simpson at 6532-6988 feet.

Benson & Benson's Seay 1, western Montague County semi-wildcat 1¾ miles southeast of Ringgold, is slated to be completed as a pumper after flowing by heads when agitated from Bend conglomerate at 5752-62 feet. The oil is black and 31-gravity, while all other Bend producing areas in the district yield light-green oil, ranging from 37 to 47 gravity.

The Mississippian lime, which has heretofore yielded a few commercial wells in given pools in southern Young County and single wells in Clay and Jack counties, attained a brighter outlook as an important source of high-gravity oil when a prolific natural flow was developed by a northern Young County wildcat. L. T. Burns et al's Larimore 1-A, NEc W½ TE&L Section 150, a mile north of Orth and adjacent to shallow production, flowed 770 barrels of 46-gravity oil on 11-hour gauge through ¾-inch tubing choke from saturation at 4897-4927 feet in Mississippian, topped at 4797 feet. Working pressure on casing dropped from 725 to 130 pounds and tubing pressure receded from 725 to 30 pounds during the above gauge. The prospect logged oil shows at intervals in the Strawn, and also in the Bend, topped at 4155 feet, but the Marble Falls zone at 4395-4797 feet was barren. This wildcat brought on a major lease play in the general area, although there is a 5018-foot failure 1¾ miles to the west and a 5092-foot dry hole 2¾ miles to the southeast. Owners of shallow properties cashed in through the sale of deep rights for substantial cash bonuses.

Southwestern Wichita County has a prospective Mississippian lime strike on the extreme west edge of the K-M-A deep area, involving Consolidated Oil Company's Barnes 1, SWc N½ NE H&TC Section 9, Block 7, with saturation at 4613-27 feet in lime, topped at 4593 feet. It was listed as a Strawn failure last December at 4025 feet, and was scheduled to be abandoned again when deepened to 4613 feet early in April. Development of the Ellenberger zone in the west portion of K-M-A is assuming important proportions. Tide Water Associated Oil Company-Perkins & Cullum authorized 6 tests on their Pettit 417-acre lease and 2 on the Pettit-State 41-acre tract, all being twin locations to flowing Strawn wells.

Consolidated Oil Company's Waggoner Est. 1-HH, SE SW NE H&TC Section 9, Block 14, is showing for a 1⅛-mile southwest extension for the Harrold 3-pay pool, Wilbarger County, having logged favorable oil saturation in the lower lime at 3237-44 feet and 3257-63 feet. Seven-inch pipe was cemented at 3255 feet to try for completion without making the customary drill-stem test. Top of saturation is 10 feet higher on structure than Kadane & Fidel's Cochran 1, which uncovered the deeper pay early in April flowing by heads at 3276-81 feet. W. B. Omohundro et al's Vaughn 1, western Wilbarger County wildcat and 1¾ miles west by south of Tolbert, passed up nominal oil stain at 3922-36 and 3939-76 feet, and was awaiting orders in Ellenberger lime at 5508 feet, having entered the latter zone at 5055 feet.

Third failure on the outskirts of the Fargo pool, Wilbarger County, was recorded by Snowden & McSweeney Company's Emmett-Gulf 1, SW SE H&TC Section 47, 1⅜ miles east of production, abandoned in Strawn at 4758 feet. Amerada Petroleum Corporation's Parker 1, an inside test, flowed 87 barrels of oil natural on 3-hour gauge through 1-inch choke from Basal Canyon at 3931-46 feet, with the hole bottomed in shale at 3949 feet. This test flowed oil through drill-stem test from stray Canyon pay at 3627-46 feet, but the zone was cased off. Contractor's rig was moved south to drill J. H. Parker 2. The company's Goodpasture 2, ¼ mile northeast of the discovery, entered Basal Canyon pay at 3973 feet, and was coring at 3980 feet. Humble Oil & Refining Company's Anderson 1-B, east edge test, was drililng at 4210 feet, while Pois-Schulz & Pigg's Green 1,

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southwest outpost, was drilling at 2200 feet.

Amerada Petroleum Corporation's Upshur County 1, southern Baylor County wildcat, was abandoned in Ellenberger at 5507-50 feet, having logged Bend at 4725 feet and Mississippian at 5245 feet without shows. In Foard County, The Texas Company's Harabal-Margaret 1, located on a 2890-acre unit, was abandoned at 5508 feet.

Shell Oil Company's Henderson 9, first deep test for the Antelope 3100- and 3500-foot Strawn pool, southwestern Clay County, resumed drilling after yielding nominal show of gas without oil or water when drill-stem tester was used at 5156-5210 feet in Bend topped at 4988 feet. The latter marker is 77 feet high when correlated with Deep Rock Oil Corporation's Dycus 1, a 5702-foot failure 1¾ miles west. Shell Oil Company's Mullins 2, west edge of the pool, flowed 196 barrels natural on 8-hour gauge from perforations opposite the upper sand at 3186-3239 feet. Bridwell Oil Company's Myers 1, Clay County wildcat 3¼ miles southwest of the Burns-Browning pool, began seeping oil and gas through surface pipe connections early last week, and when uncapped flowed 37.8-gravity oil for a brief period. It was temporarily abandoned last March in Ellenberger at 6038-65 feet, and will be cased to make a production test. Oil saturation was passed up in the Bend and Mississippian zones topped at 5486 feet and 5997 feet, respectively. The company's Myers 2, 6000 feet northeast and southeast of an abandoned Strawn wildcat pumper, logged promising oil show in sand at 3980-88 feet, and was coring at 4005 feet in shale.

Rathke Oil Company's Swaggerty 1, NEc SW BBB&C Section 258, Throckmorton County Ordovician project, was running 7-inch pipe after testing show of oil with 3500 feet of water in top section of Bend at 4462-4500 feet, with the hole bottomed at 4516 feet.

East Texas

Bazette Structure Test Has Oil and Gas in Woodbine

The Bazette faulted structure in northeastern Navarro County has reentered the picture as a prospective producing area through Lyman T. Davis et al's Davis 1, near southwest corner of a 91½-acre tract, T. J. Jordan Survey, having logged broken Woodbine sand, carrying oil and gas, in drilling to 3083 feet. Casing will be landed on bottom to try for completion through perforations about 10 feet off bottom. Top of Woodbine series was called at 3038 feet, with an elevation of 400 feet. This prospect is a mile southwest of Bazette townsite, and is an offset to Penn-Windsor et al's Absher 1, which blew in as a gasser at 3086 feet in February, 1925, but later had to be abandoned due to excessive water. Penn-Windsor et al later drilled eight failures along the Bazette fault trend, including several that showed gas with water. This early development preceded the use of electrical formation surveys and accurate use of casing perforations for completing wells in thin pay areas.

A recycling plant and pipe-line outlet for high-pressure gas produced in the Willow Springs deep pool, situated east of the Gregg County portion of the East Texas field, is slated to follow purchase by Lone Star Gas Company of one-half interest in Roger Lacy's properties for $200,000 cash. Lacy has two gas-distillate producers in the 7300-foot Pettit, and is drilling a third test. He has in operation a gas distribution system that makes deliveries to Longview, Willow Springs, Gladewater and Kilgore. Lone Star Gas Company proposes to build a gas line from the Willow Springs area to the Opelika field, Henderson County, where connection will be made with its main Texas distribution system.

Sun Oil Company's Henderson 1, first Trinity test for the Ore City area, Upshur County, was abandoned in Travis Peak at 7808-7923 feet. L. S. White & O. S. Strickland's Gorman 1, southwestern Upshur County wildcat and a mile southwest of Big Sandy, is credited with having logged nominal oil saturation at 1345-65 feet, and was awaiting orders at 1870 feet.

Texas Land Officer Asks Full Allowable at KMA

Texas State Land Commissioner Bascom Giles has demanded the full allowable, regardless of acreage assigned, for wells drilled to the Ellenberger in the Wichita River bed where it passes through the KMA oil field.

At a hearing held in his office last week, Giles told operators that if the wells got a full allowable, then wider spacing would be approved by his department; otherwise, he would ask for numerous wells. The river bed is not leased now, but Giles hoped as a result of this conference to be able to advise prospective bidders how many wells they would be expected to drill.

Under Texas Railroad Commission rules, standard 20-acre spacing is in effect, but operators may include 40 acres. The oil is allocated on acreage and per-well, with 50 percent on each factor.

The Land Commissioner offered to offset 40-acre spacing with wells drilled 2640 feet apart in the river bed. Where the offset leases are drilled on a 20-acre pattern, he agreed to require wells at intervals of 1866 feet. However, to offset this concession, he insisted that wells offsetting 40-acre tracts be given the full 40-acre allowance, and that wells offsetting the 20-acre tracts be given the full 20-acre allowance.

Giles indicated he was confident the Texas Railroad Commission would approve this program, despite the fact that it would be in direct contravention of the method of allocation for the KMA-Ellenberger, as provided in commission rules. He said that the plan was in operation in two other fields in the state, and pointed out that it eliminated concentration of drilling along the river bed.

The statute provides that operators of river bed tracts must drill a well for every offset drilled within 1000 feet of lease lines. Under the plan proposed, the state would not insist on its full rights under this statute.

Texas Permits

The Texas Railroad Commission last week issued permits for 232 wells, 108 less than the previous week.

North Texas had 67 permits, including 17 in Archer, 14 in Wichita and 13 in Young County, while Panhandle operators reported 8 locations.

Two permits were granted in the East Texas field, both in Gregg County. Six were authorized in the remainder of the East Texas area.

Operators in West Texas were permitted to drill 56 wells, including 19 in Hockley County, while West Central Texas reported 10 locations.

There were 61 permits in Southwest Texas, including 17 in Jackson and 10 in Starr County. Gulf Coast operators were granted permission to drill 22 wells.

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Southwest Texas

Cycling Plants Projected in Jackson and Duval Counties

Two recycling plants will be built and at least 18 deep wells drilled at Francitas in Jackson County, and at Sejita in Duval County. Construction is to start immediately on the Francitas plant, where H. B. Zachery, Larry O. Cox, and others have taken over the distillate properties of the several companies in the field. It will have a capacity exceeding 50,000,000 cubic feet, and is to be built by H. B. Zachery Construction Company. Eight wells are to be involved in the initial development, to go to sands ranging from 7450 to 8650 feet.

The set-up includes a complete unitization of the distillate zones. Operators will receive a proportionate over-riding royalty, royalty owners will continue to receive their royalty interest, and oil rights will be retained under present lease contracts.

Three companies have seven oil wells making about 450 barrels per day from sands at 7350-7400 feet and 7900-75 feet. They include British American Oil Producing Company, Housh & Thompson, and Skelly Oil Company. Other acreage and interest holders in the field include The Texas Company, Sun Oil Company, Gulf Oil Corporation, Mills Bennett, Republic Production Company, Wynn Crosby Drilling Company.

Unitization at Sejita

Unitization of Sejita is now under way by Champlin & Bass, of Dallas, who have taken distillate rights under several thousand acres, covering the major portion of the structure. Sun Oil Company, Magnolia Petroleum Company and several others hold leases within the limits of the probable distillate production. The project would involve a plant of at least 50,000,000 cubic feet capacity. Eight to ten more wells would be drilled to the 5350-5660-foot zone.

The field was opened in October, 1939, by Standard Oil Company of Texas' Casey 1. The well flowed 51.6-gravity distillate at 5334-45 feet. In March of 1940, the same company drilled Rodriguez 1 about one mile northwest of the discovery, completing it through a series of perforations at 5647-60 feet, 5569-81 feet and 5524-60 feet and 5460-75 feet, the whole zone producing gas and distillate. The well also found a sand at 6790-6838 feet which developed gas and distillate.

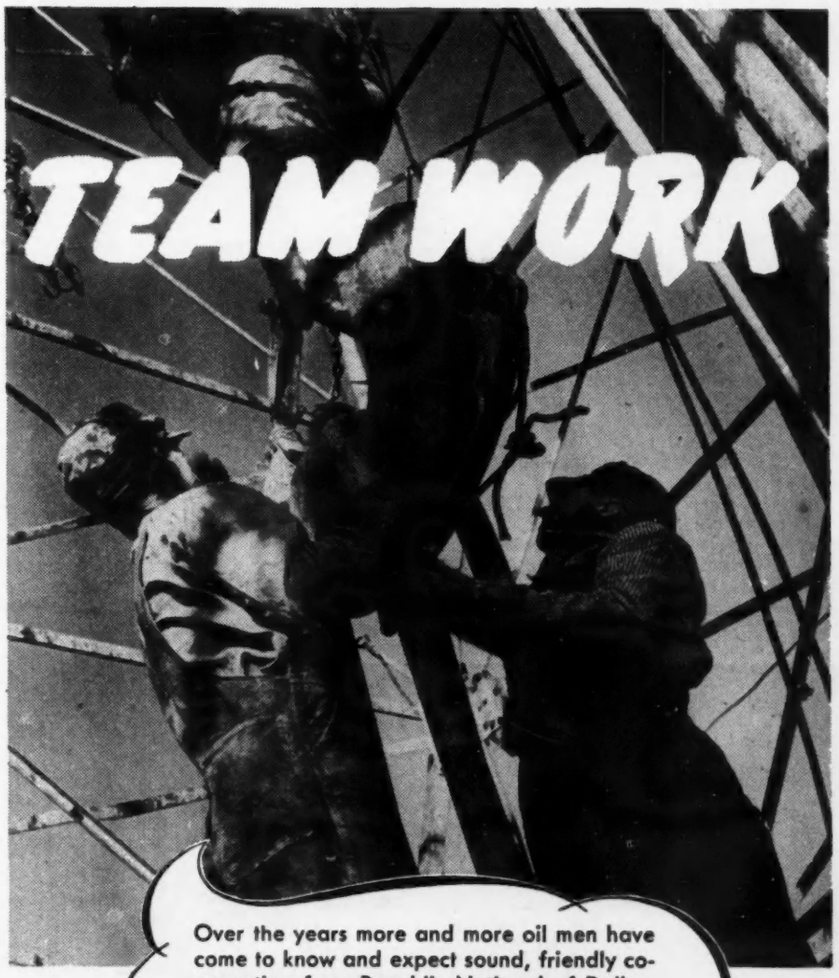
North Agua Dulce Extension

Two miles northeast of North Agua Dulce field, Nueces County, W. B. Osborn and Mid-Continent Petroleum Corporation's Burow flowed distillate and gas and efforts were being made to reduce the gas ratio. Perforated at 6712-6714 feet, the well flowed 22 barrels of 60.5-gravity reddish brown distillate in 3 hours through 7/64-inch choke under 1635 pounds tubing and 2200 pounds casing pressure. Gas/oil ratio was 2300 to 1. Later, flow was 9 barrels in 6 hours through the same choke with 2000 pounds tubing and 2300 pounds casing pressure, the gas/oil ratio being 10,000 to 1. When first tested, the sand yielded 46.6-gravity oil. This gives rise to the belief that gas is channeling into the well. A squeeze job may be made to allow tests in other sands.

Stanolind Oil & Gas Company's Thompson 2, one mile north of the 5000-foot Riverside field, Nueces County, was completed through perforations at 6970-6975 feet, rated as a large gas well with a spray of fluid. It opens a second pay for the pool.

A third squeeze job was made in an effort to kill the gas intrusion in Magnolia Petroleum Company's Seeligson 1, Unit 4, new field discovery, two miles southeast of the Premont field in Jim Wells County. After coring sand at 5019-38 feet, casing was landed on bottom and perforated at 5024-30 feet. The well flowed oil, but the gas volume was extremely high. The first two squeeze jobs cut off some of the gas. A third apparently was successful and plugs were drilled preparatory to coring deeper into the sand.

A new sand was opened and the northern tip of the East Premont field, Jim Wells County, extended one mile west by Magnolia Petroleum Company's Seeligson 15. The test cored the zone at 5885-5900 feet, 600 feet above the main field sand and casing was set at 5900 feet. Hole was drilled 3 feet deeper without finding new oil showing and perforations were made at 5897-99 feet. On a 24-hour gauge it flowed 167.43 barrels of 39.9-gravity oil through 5/32-inch choke. Pressures were 900 pounds



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on tubing and 1000 pounds on casing. Gas/oil ratio was 669 to 1 with no water in the flow.

A new field for Calhoun County is apparent with Gulfboard Oil Corporation waiting on cement after setting casing in State 1, southwest corner of Tract No. 177. Hole was drilled to 6460 feet and tests indicated oil sands at 6250-6265 feet and again at 6295-6315 feet. Pipe was landed on bottom. The well is in San Antonio Bay and is ten miles east of Seadrift.

Pure Oil Company has indications of a new sand in the West Ganado area of Jackson County with Spacek 2, a west outpost, which flowed 167 barrels of 32.4-gravity oil, 30 barrels of brackish water and 519,000 cubic feet of gas per day through 10/64-inch choke after perforations at 5980-98 feet. These perforations were squeezed and new holes are to be made in an upper zone, apparently between 4700-90 feet, where a drill-stem test indicated a commercial well.

Humble Oil & Refining Company's Robbins 2, a 2/3 mile northeast extension to the LaWard field, Jackson County, has been gauged. It flowed 173.12 barrels of oil per day through ¼-inch choke under 225 pounds tubing and 525 pounds casing pressure, production being 25.5-gravity oil, from sand at 5228-5233 feet.

Marts & Beaven definitely opened the Elgin field, Bastrop County, with the completion of Walker 1-A, Glasscock Survey, four miles east of Elgin. Plugged back to 2920 feet from 3345 feet, an acid treatment to the chalk placed it in a condition to give up 4 barrels of 36.4-gravity oil per hour via pump. Austin chalk was topped at 2605 feet and 5½-inch casing landed at 2650 feet. Rig was skidded to the same operator's Cheney 1.

On the Carrizo structure in Dimmitt County, a northeast offset to the discovery well has been abandoned. The well is Renalia Oil Company's McKnight 1. It had been drilled to 2466 feet and after failing to find the discovery pay, was plugged back and tested salt water in a zone at 2223-41 feet.

Muralla field of Duval County gained a mile east extension with completion of E. R. Thomas Estate's Parr 1, Block 18, Callaghan Subdivision, Adams Survey No. 11. Perforated at 4711-12 feet, the well flowed 52.4 barrels of high-gravity oil per day through 7/32-inch choke, tubing pressure being 1000 pounds and casing pressure 1180 pounds. It topped Pettus at 4708 feet and drilled to 5025 feet, landed casing at 4782 feet, and plugged back to 4726 feet.

A new Queen City sand for Lopeno, Zapata County, appeared to have been uncovered as Venture Petroleum Company tested Ramirez 1-B, Block 3, Share 1. Hole was drilled to just below 3100 feet and first perforations made in the top 25 feet of a sand at 2660-2714 feet, where salt water broke in. This is believed to be due to a bad cement job. Casing then was perforated in the 2400-foot sand where the hole was finished as a gas producer.

Texas Gulf Coast

New Chambers County Area Opened by 230-Barrel Well

Sun Oil Company's Felix Jackson 3, two miles west of production in the Willow Slough field, eastern Chambers County, flowed at the rate of 230 barrels daily through a ¼-inch choke from 75 casing perforations at 8250-80 feet. This sand is about 200 feet above the pay from which the Willow Slough field produces, and the well, being separated from the field by dry holes, apparently opens a new producing area for Chambers County. It had drilled to 8294 feet.

To the northeast, in the Fig Ridge area, Sun Oil Company was completing its second well, Meckelburg Unit 1, at 8852 feet, while The Texas Company's west outpost in this new field was still well above the expected pay.

Humble Oil & Refining Company contributed two producers in the Red Fish Reef field, one from the 8700-foot sand, Galveston Bay 16-A, and one from a deeper sand, Galveston Bay State 18-A. The deeper well made eight barrels hourly through a ⅛-inch choke from perforations at 10,333-346 feet.

Near Liverpool, in Brazoria County, and just northwest of Chocolate Bayou, made location for a wildcat on the Triangle Development Company lands in the Hooper & Wade Survey No. 3. This well would be between Chocolate Bayou and Rowan fields, on a farmout from Gulf Oil Corporation, but it is in an area where the latter company, Sun Oil Company, Phillips Petroleum Company, Stanolind Oil & Gas Company and others own considerable acreage and it may not be drilled unless the proper kind of a deal can be worked out for support by interested companies.

West of Chenango, Stanolind Oil & Gas Company and Gulf Oil Corporation have abandoned Lorenzo Vieman 1 at 9750 feet after failure to get encouragement to a point 1000 feet below the producing horizon in the Chenango field's only producing well.

The Pure Oil Company's Greenameyer 1, at Manor Lake, was below 8150 feet, coring the breaks with no shows found thus far.

Charles Hooks et al's wildcat north of Hightower, northern Liberty County, was abandoned at 9702 feet, about 800 feet in the Wilcox formation.

Location was made by Frazier & Hankamer for a wildcat south of Orange. Location is 303 feet west of the Sabine River, and 712 feet north of the south line of a lease farmed out by The Texas Company. It is just south of the Orange municipal slip.

Progress on new wildcats has been slowed down by exceptionally heavy rains throughout the Gulf Coast area. Providence Oil Company's Hatfield 1, at Clodine in Fort Bend County, was waiting for ground to dry out to move in equipment. Others, including two north Harris County wildcats, were also at a standstill. Lon Cron et al's McGill 1, at Lissie in Wharton County, reached 6531 feet, over 200 feet into the Cockfield, topped at 6252 feet, and had to shut down for high water.

Texas Hearing

The Texas Railroad Commission has scheduled the following hearings:

April 29, allowable increases for the Markham field, Matagorda County; the West Beaumont field, Jefferson County, and Henderson field, Winkler County; a hearing to consider revision of operating rules for the Iatan-East Howard field, Howard and Mitchell counties.

April 30, amendment of field rules for the Burns-Browning area in Clay County, Coletto Creek field in Victoria County, and the Turkey Creek field in Nueces County.

May 1, allowable increase for the Pittsburg field, Camp County; revision of operating rules for the Means field, Andrews County, and repressuring of the 2700- and 2800-foot sands

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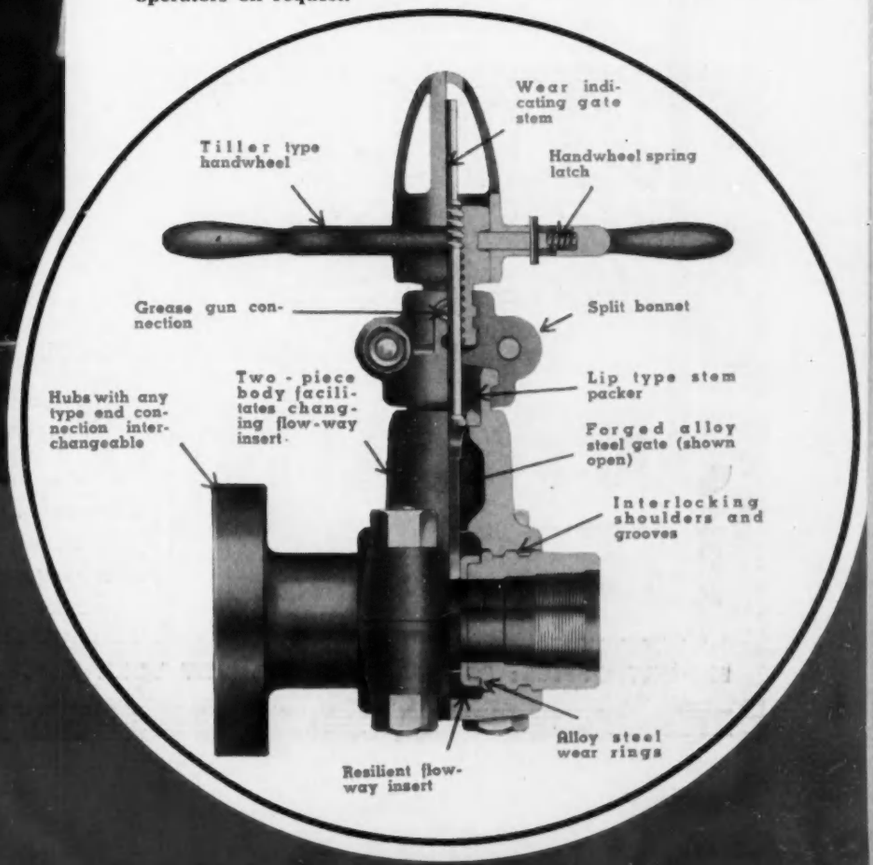
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in the O'Hearn field, Webb and Duval counties.

May 2, amendment of spacing rules in the Amelia field, Jefferson County; and new operating rules for the area surrounding The Texas Company's Bindel 1, in Cooke County.

Carlile Field Rules

The Texas Railroad Commission has entered an order providing for 20-acre spacing for wells in the Carlile field, Stonewall County. If the operator elects to do so, he may drill on 40-acre units, but these wells must be 1320 feet apart.

Proration is on acreage and per well, with 50 percent allocated on each factor. A maximum of 50 acres may be assigned to the final well on a lease.

Louisiana Gulf Coast

Pine Prairie Discovery Proves Good Producer

Opening a new field, C & I Production Company et al's Evangeline Land & Minerals 1, on the east flank of the Pine Prairie dome in Evangeline Parish, on a 2-hour test indicated flow of 810 barrels of clean 40.5-gravity oil daily through a ¼-inch choke. Tubing pressure was 1425 pounds while the casing was 1460 pounds. The gas/oil ratio was 890 to 1 with gas volume 725,000 cubic feet per day. Production is from the Yegua section of the Upper Saline Bayou. The Cockfield was topped at 7903 feet. Electrical log indicated the oil sand at 8189-8235, the total depth being 8236 feet, with perforations at 8228-8235 feet with 20 holes.

The Texas Company's State 1 on the Octave Pass prospect in Plaquemines Parish, produced 129 barrels of oil in 24 hours through 3/16-inch choke with pressure about 800 pounds. Total depth is 11,494 feet, with casing perforated at 11,420-450 feet.

On the east flank of Edgerly in Calcasieu Parish, Gulf Refining Company opened a new gas producing zone in Miller 1. Completed as a gas well making some oil, it was perforated at 6932-6939 feet and 6911-25 feet. Total depth is 8502 feet. Other tests below this producing level failed to show anything of commercial value.

Sinclair Prairie Oil Company's Aragon Plantation 1, Terrebonne Parish wildcat, showed saturation on electrical survey and was drilling below 10,900 feet at the end of the week. The saturated section was indicated at 8112-22 feet and 9333-49 feet on the log which was run at 10,022 feet. The well, located on the Bourg prospect in Section 5-18s-19e, is the first of a scheduled two-well program.

In the West Alexandria area, Navarro Oil Company's Wilcox wildcat has encountered Wilcox at 4658 feet, showing salt water. The well is continuing to drill to its contract depth of 7000 feet and has about 800 feet to go. The Cockfield and Sparta sections also showed water.

Atlantic Refining Company started rigging Rice Land & Lumber Company D-1 in the Newlin area of Beauregard Parish. It will be a 9000-foot test with Wilcox objective. Otis Dyer of Houston was awarded the drilling contract.

Two abandonments occurred during the week in the Bayou Pigeon field in Iberia Parish. They are Plymouth Oil Company's Jeanerette 1, a 1-mile northwest outpost, which was dry below 11,900 feet, and McHugh 2 which was abandoned just below the regular 8000-foot level.

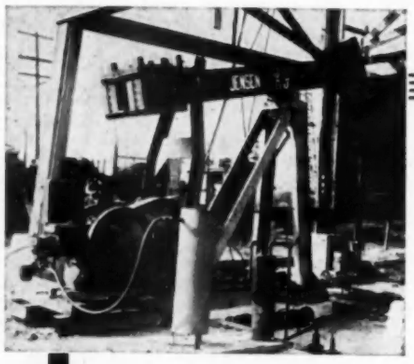
North Louisiana

Olla Trend Discoveries Attracting More Development

Recent discoveries of new pools in the shallow Wilcox in the "Olla trend" in LaSalle Parish have spurred development around the discovery wells and also has renewed interest in that part of the trend. For several weeks the play had been in Natchitoches and Winn Parishes.

New locations were being made almost daily in the South Olla, Little Creek and Hemphill fields, all in LaSalle Parish. Three new wildcat blocks were announced in this parish, all of which will have Wilcox tests during the spring and summer.

Frank Soap leased 3000 acres around Sections 1 and 2-6n-4e, some of the leases extending into Catahoula Parish. Joe Bell assembled a 5000-acre block



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around Section 54-9n-5e, Catahoula Parish, and in the Galvin Creek area R. E. Anderson secured 1200 acres.

H. R. Scivally made location for a wildcat test in Winn Parish, Crooks 1, NE NE SW 1-6n-4w. Plummer & McDaniels' Phares 1, NW SW 4-5n-12w, Sabine Parish wildcat, was temporarily abandoned after a test showed some gas with salt water with casing shot with ten shots at 2394-2400 feet and with 24 shots from 2266-74 feet.

Indications that gas in the shallow Sparta may be found in the Olla field was seen last week when Placid Oil Company's Taliaferro 1, SE NE 26-10n-2e, blew out while drilling at 1800 feet but was brought under control. The Sparta was believed the source of the gas at around 1350 feet.

Arkansas

Rains Defer Budding Spurt Of Drilling Activity

Rains and high water interfered materially with drilling operations last week in South Arkansas, just as drilling was showing an increase with the coming of spring.

In the Dorcheat Smackover lime field in Columbia County, operations were halted at four of the five active locations in that field. Three of the four active tests at McKamie, LaFayette County, were affected by either high water or bad roads.

Louark Producing Company made location for another Paluxy sand test in the erratic Fouke field, Miller County, at Sturgis B-1, C SE 2-17-27.

M. D. K. Fitzwater and associates ran casing for production test at Smart 1, NE SE 14-15-20, Stephens district, Columbia County, which cored 6 feet of oil saturation in a core at 3421-31 feet in the Travis Peak, a new horizon for that old field, discovered in 1921.

Mississippi

Three Widely Separated Wildcats Have Oil Shows

Wildcats in three widely separated parts of Mississippi last week reported shows of oil.

In Clarke County, E. C. Johnston's (formerly Walsingham & Earles) School Board 1, SW NW NE 16-4n-15e, arranged to run casing at 4057 feet after sidewall cores were taken and electric log revealed oil showings at 4047-57 feet.

In Grenada County, Grenada County Drilling & Development Company's Connecticut Life 1, NW SE 28-23n-5e, ran electrical log to bottom at 3004 feet and planned to core a few feet deeper before setting casing to test showings of oil at that level and also at 2712 feet.

In Sharkey County, British-American Oil Company's Houston A-1, N½ NE SW 23-11n-7w, ran formation tester and recovered 120 feet of oil-cut with mud at 3281-96 feet and was coring at 3305 feet. The oil showing was in Selma chalk. This test is 25 miles west of Tinsley Dome.

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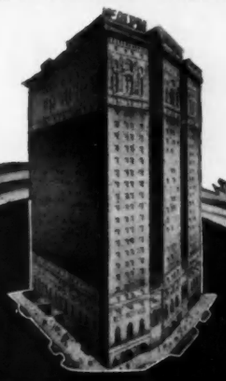

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Michigan

Bay Deep Test Progress Slow in Side-Tracked Hole

From a side-track point of 6265 feet, Gulf Refining Company has drilled off to 6688 in a directional 3-degree west hole in Bateson 1, Section 2-14n-4e, Bay County deep test. Progress has been slow due primarily to difficulties in keeping drilling mud built up to 14.2 pounds necessary to adequately hold back gas in the Salina. Apparently drilling mud reaches one or several of the cavities in the salt section and there, while in a static condition, gradually absorbs gas until it goes back into the drilling mud to lighten it to 10 pounds or less and start a semi-blowout condition.

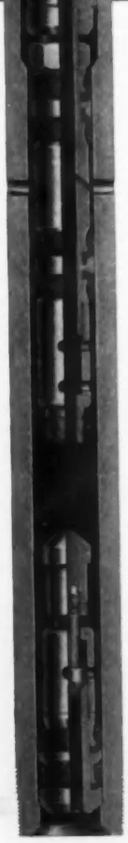
Delayed by muddy roads in getting pumping equipment set, Chapman Oil Company's Nitsche 1, NE SE SE 33-15n-4e, Bay County, ¾-mile northwest extension of the Monitor field, was pumping from 20 to 30 barrels of oil a day natural. The test is significant not only as an extender of the field, but in apparently establishing a producing closure of at least 97 feet for the Dundee horizon in the field. Test is producing from Dundee logged at 2800 and bottomed at 2945 feet. It probably will be acidized later.

Sun Oil Company's Watson 1, NW NE NW 25-24n-2w, Roscommon County, one of the best structural wildcats ever drilled in the county, logged Dundee at 2900 feet, and was drilling at 2969 feet April 22 without an oil saturation point in the objective formation.

The Pure Oil Company abandoned State A-2, Section 15-19n-3e, Arenac County, after two acid treatments failed to establish commercial production in the Monroe at a plug-back depth of 4299 feet. Test was originally carried to 4960 feet for a record depth in the Adams field.

Wolverine Natural Gas Company shut down for orders on Dickerson 1, NE NE NE 4-1n-9w, Barry County wildcat, at 2300 feet, after testing 116,000 feet of gas in the Monroe lime at 2196 feet. Test may be carried deeper.

Regal Dutch Petroleum Company was running a string of 5-inch casing at 3232 feet on Heasley 2, Section 21-4n-13w, Allegan County, first deep test in the Salem field. Casing is to shut off 330,000 feet of gas in the Salina at 2730 feet, and water at 3200 feet.



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***with an* OTIS TYPE G**

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California

Rincon Field May Have New Zone Below 7500 Feet

Chanslor-Canfield, Midway Oil Company appears to have opened a new deep zone in the Rincon field, Ventura County, with Hobson C-9, deep test in Section 17-3-24. Well has cored alternating bodies of sand and shale from 7539 feet to present bottom at 8073 feet. Last cores were in tight sand, with cores from 7539 feet giving every indication of a new high-pressure, prolific producing zone. Formation test run below 7539 feet resulted in recovery of 32 stands of oil and 9 stands of mud and drilling fluid.

New zones cored are reported to tie in with productive zones found in the San Miguelito and Ventura Avenue fields, southeast of the Rincon field. Hobson C-9 is the first deep exploratory project to be drilled in the field in several years. Richfield Oil Corporation some years ago tested the area to 7300 feet, but apparently failed to go deep enough to pick up the zone cored in Hobson C-9.

R. E. Havenstrite has been given further encouragement on the outlook for Lincoln 3, outpost in the Del Valle field, with coring fair-looking oil sand in the interval between 7350 and 7390 feet. Before picking up present showings, it appeared to have missed the productive horizon found in the field discovery a few locations northwest.

Honolulu Oil Corporation's No. 25-P, deep test in Section 10-32-24, Buena Vista Hills area of Kern County, was drilling and coring at 13,400 feet in black shale with occasional streaks of hard sand, believed to be lower Miocene. Strong gas showings have been reported in coring from 13,370 feet.

The Texas Company abandoned S. P. No. 27-13, wildcat in Section 13-17-15, Cantua Creek-Turk area of Fresno County, after running a series of formation tests to bottom at 9673 feet. Test on interval 8672 to 9380 feet, with valve open three hours, resulted in flow of 1,000,000 feet of gas, together with 1200 barrels daily rate of salt water. Results are not unlike those encountered in several other prospects in this area.

UNITED STATES WELL COMPLETIONS

Arkansas

La Fayette County (Buckner)—

Company, Well and Location	Init. Prod. Bbls.	Depth
E. G. Bradham, Pelt 1, 7-16-22	240	7272

California

Fresno County (Cantua Creek)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Texas, S. P. 27-13 (pb 9365)	*	9673

Fresno County (East Coalinga Eocene)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Robert S. Lytle, No. 57-7F	2200	7766
Texas Co., Exeter 6	1149	8198

Fresno County (Kettleman North Dome)—

Company, Well and Location	Init. Prod. Bbls.	Depth
KNDA, No. 341-18Q	235	10015

Kern County (Belridge)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Belridge Oil Co., No. 4-35	695	8230

Kern County (Coles Levee)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Richfield, KCL-B 52-4 (pb 9568)	372	9750

Kern County (Greeley)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Superior, Moore 1	1620	11500

Kern County (McKittrick)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Ebert E. Smith, Smithhart 1	*	2339

Kern County (Mount Poso)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Shell, Security 24	303	2005
Security 25	185	2085
Security 26	230	1980
Vanguard Oil Co., Baker 12	150	1756

Kern County (Ten Sections)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Shell, KCL A-26-29	1726	8390

Los Angeles County (Long Beach)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Shell, Alamitos 46	201	3840
Texas, Robinson 6	81	3280

Los Angeles County (Newhall-Potrero)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Barnsdall, RSF 18	500	7575

Los Angeles County (Wilmington)—

Company, Well and Location	Init. Prod. Bbls.	Depth
D. D. Dunlap, No. 4	266	3580
Long Beach Oil Dev. Co., No. 22	1080	4193
Port Oil Co., No. 3	150	3710
Union Pacific, U. P. 117	301	2854

Orange County (Huntington Beach)—

Company, Well and Location	Init. Prod. Bbls.	Depth
H. C. Morton, No. 2	100	4842

Ventura County (Rincon)—

Company, Well and Location	Init. Prod. Bbls.	Depth
CCMO Co., Hobson B-44 (pb 4700)	335	4850

Ventura County (Ventura Avenue)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Alliance Pet. Corp., Hartman Ranch 3	1707	7641
Tide Water, Hartman 26	718	9900

OLD WELLS DEEPENED

Fresno County (Northeast Coalinga)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Bandini Pet. Co., 71-30B (otd 8182)	300	8256

Los Angeles County (Dominguez)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Hiles Dr. Co., Grant 1 (otd 7200)	1000	7255

*Failures; †Junked; ¶Million cu. ft. gas.

Colorado

Boulder County (Warren Field)—

Company, Well and Location	Init. Prod. Bbls.	Depth
J. A. Warren, Maxwell 3, nw nw 24-1n-71w	*	....

Illinois

Clark County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Neal Stewart, Wallis 1, nwc sw se 8-10n-14w	*	640

Clinton County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Shell, Criley 23, ne nw ne nw 2-1n-1w	48	1367
Union Pipe Line, Twenhafel 1, se sw se 8-1n-2w	*	1274
B. E. Martin, Brinkmann 1, swc se 9-1n-2w	*	1558
P. J. Campbell et al, Baum 1, ne se ne 21-3n-2w	*	1426

Edgar County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Measley et al, Thompson 1, nw ne nw 1-16n-11w	*	1200

Fayette County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Carter, Miller 3, nw sw se 1-8n-3e	120	1487

Franklin County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Adkins, Orient 6, se se sw 24-6s-2e	300	2137
Simpson 1, ne ne nw 25-6s-2e	384	2141
Wegener, C.W.&F. Coal Co. 3, ne sw sw 24-6s-2e	435	2120
Shell, Doty 3, se nw ne 25-6s-2e (pb 2160)	331	2164

Gallatin County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Carter, Rister 3, nw se nw 4-8s-8e	50	1724
Duncan-Lester, Green 1, ne ne ne 14-8s-8e	*	3048
Halbert, Curry 1, sw sw nw 15-8s-10e	352	2074
Egyptian Tie & Timb., Fee 3, nwc ne se 16-8s-10e	365	2074

Hamilton County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Hall-Jordan, Deerhake 3, sw nw ne 34-3s-5e	225	3326
Deerhake 4, ne nw ne 34-3s-5e	480	3328
Wickwire & Powers, Patterson 1, w½ nw nw 1-4s-6e	*	3450
Parker Dr. Co., Trobaugh 1, ne se sw 27-5s-6e	11	3076
Sinclair-Wyoming, Friel 19, sw ne sw 34-5s-6e	10	2991
Texas, Howell 2, nw ne sw 3-6s-6e	100	3070
Flint 1, ne sw sw 3-6s-6e	*	3187
Turner 1, nw ne ne 10-6s-6e	*	3229
A. A. Cameron, Johnson 1, nw se ne 6-6s-7e	280	3039

Jasper County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Pure, Dickerson Cons. 2, c w½ ne nw 20-5n-10e	21	2825
Robins Cons. 2, c w½ se nw 20-5n-10e	218	2840

Lawrence County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Frontier Oil Co., Gillespie 4, sw se se sw 13-4n-11w	¶3.4	804

Marion County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Texas Co., Fossieck 13, sw nw nw se 29-2n-2e	250	4630
Chi-Tonti (Romine), Varde 1, sw se sw ne 33-3n-2e	*	3675
Adams O. & G., Davidson 4, c w½ nw se 21-4n-1e	22	1432
Gulf, Hill 3, se sw sw 26-4n-1e	100	1372
Shell, Davidson 4, se ne ne 34-4n-1e	174	1369
Schoenfeld et al, Thalman 2, ne nw nw 35-4n-1e	10	1376

Morgan County—

Company, Well and Location	Init. Prod. Bbls.	Depth
C. J. Hunt, Cuddy 2, ne nw nw 2-13n-10w	*	1512

Richland County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Sheaffer et al, Murray 1, ne se sw 32-4n-9e	*	3056

Wabash County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Oliver Phipps et al, Banks 1, sw nw sw nw 6-1n-11w	*	1370
White & Wickwire, Fox 1, nw nw nw nw 19-1n-11w	*	2346
Keneipp et al, Cissel Hrs. 2-D, nw ne ne sw 1-1n-12w (pb 2149)	30	2210
Joe Young, Fox 8, nw se ne 1-1n-12w	12	2081
O'Meara Bros., Couch 1, sw sw nw 16-1s-12w	*	926
Gould 4, se nw se nw 17-1s-12w (pb 2071)	20	2399
Gould 7, ne nw se 17-1s-12w (pb 2035)	75	2040
Hall-Jordan Oil Co., sw ne sw se 17-1s-12w (pb 2057)	*	2383
Vanleer 1, sw nw nw ne 20-1s-12w	4½	2395
Warren & Bradshaw, Kuhn 1, se ne sw se 17-1s-12w (pb 1535)	*	2367
Gilster & Smith, Risley 2, ne se sw ne 18-1s-12w	206	2097
Straube & Straube, Mt. Carmel Comm. 2, nw se se ne 18-1s-12w	219	2079
Ill-Mid-Cont., Bancroft School 2, sw sw nw ne 20-1s-12w (pb 2385)	250	2494
L. B. Jackson, Alka 1-A, ne nw se 34-1s-13w	130	2636

Wayne County—

Company, Well and Location	Init. Prod. Bbls.	Depth
C. R. Craft, Fisher 1, sw se nw nw 34-1s-7e	7	3295

White County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Longhorn Oil, Helm 10, nw se se 22-3s-14w	143	2792
Arrow Dr. Co., Hon 2, sw sw sw 33-3s-14w	598	2970
Buell & Herndon, Bond 9, se ne ne 8-4s-14w	300	2841
Garrison 3, ne se nw 8-4s-14w	250	2852
Garrison Hrs. 2, nwc ne 8-4s-14w	100	2841

[*Continued on next page*]

Summary of Drilling Operations in the United States, Week Ended April 26, 1941

	WELLS COMPLETED								*PERMITS FOR NEW WELLS				
		New Wells Drilled for Oil and Gas											
	Total for Week	Oil Wells	Gas Wells	Failures	†Miscellaneous	Initial Production	Total 1941	Total this Date 1940	This Week	Total this Month	Total 1941	Total this Date 1940	Year Total 1940
Arkansas	1	1	....	....	....	240	51	68	4	18	51	42	153
California	26	24	....	2	....	15,604	352	354	22	90	303	351	1,042
Colorado	1	....	....	1	....	.....	6	3	....	.....	.....	.....	.....
Illinois	78	54	1	19	4	9,081	1,010	1,146	76	311	1,249	1,281	4,532
Indiana	16	8	2	5	1	889	153	128	....	.....	.....	.....	.....
Kansas	40	31	....	8	1	39,083	626	515	42	180	604	623	2,048
Kentucky	4	3	....	1	....	20	82	80	....	.....	.....	.....	.....
Louisiana	19	14	....	5	....	2,515	426	502	34	129	489	487	1,658
Michigan	19	9	1	9	....	5,052	258	434	21	58	250	400	1,093
Mississippi	1	....	....	1	....	.....	46	50	....	.....	.....	.....	.....
Missouri*	1	....	....	1	....	.....	2	2	2	3	5	.....	26
Montana	3	2	....	1	....	30	64	44	....	.....	.....	.....	.....
Nebraska*	3	1	....	2	....	340	28	.....	1	7	24	.....	69
New Mexico	4	4	....	....	....	1,428	113	264	8	28	123	236	559
New York	17	12	....	....	5	75	214	365	....	.....	.....	.....	.....
Ohio	34	10	11	8	5	82	496	242	....	.....	.....	.....	.....
Oklahoma	41	19	3	17	2	6,311	621	728	37	184	593	650	1,888
Pennsylvania	58	35	8	4	11	40	675	1,215	....	.....	.....	.....	.....
South Dakota	.....	....	....	....	....	.....	....	1	....	.....	.....	.....	.....
Tennessee	....	....	....	....	....	.....	....	7	....	.....	.....	.....	.....
Texas	198	127	7	63	1	65,269	2,918	3,399	232	1,033	3,395	4,078	11,170
West Virginia	13	....	8	5	....	.....	222	178	....	.....	....	191	782
Wyoming	3	2	....	....	1	675	33	55	....	.....	....	.....	1
Total this week	580	356	42	152	31	146,734	8,396	9,780	479	2,041	7,086	8,339	25,021
Total last week	571	365	42	121	43	164,020	7,816	9,210	603	1,532	6,607	7,684	25,021
Total this year	8,396	5,355	743	1,924	375	2,513,843	....	.....	....	.....	....	.....	.....

* This tabulation includes those states where weekly data are available; figures for Missouri date from August 10, 1940; Nebraska from August 3, 1940.
† Includes old wells deepened, water-intake, gas input, and salt water disposal wells.

United States Well Completions—*Continued*

ILLINOIS—Continued

Company, Well and Location	Init. Prod. Bbls.	Depth
Cherry & Kidd, Gray 4, se sw se 8-4s-14w	90	2840
Haynes & Schnooke, Hon 2-D, nw sw se 9-4s-14w (pb 2741)	27	2865
Bell Bros., Skiles 4, nw nw sw 16-4s-14w	240	2863
Skiles 5, sw nw sw 16-4s-14w	220	2854
P. Miller, Ford Hrs. 1-A-2, nw sw sw 16-4s-14w (pb 2600)	200	2607
Ford Hrs. 1-A-3, nw sw sw 16-4s-14w	50	2209
Ford Hrs. 4-B, sw nw nw 21-4s-14w	200	2854
Ford Hrs. 3-B, nw nw nw 21-4s-14w	175	2859
Walter Duncan, Hughes 6-A, se ne se 17-4s-14w	80	2594
Jack Meyers, Hon 1, ne se se 20-4s-14w	*	2882
W. W. Grey, Fee 7-H, se ne nw sw 21-4s-14w	300	2850
Superior, Collins 3, nw sw se 22-4s-14w	102	2928
Ford 4, sw nw se 22-4s-14w	75	2916
Collins 3, sw se nw 33-4s-14w	200	2730
Greathouse 1, se sw sw 34-4s-14w	76	2924
Yingling et al, Ford Hrs. 2, se ne sw 22-4s-14w (pb 2874)	143	2910
Tide Water, Elliott 1, se sw ne 29-5s-14w	*	3207
C. D. Neff et al, Lamar 1, c nw nw nw 1-5s-10e	4	3040
Hiawatha Oil, Stimson 2, se sw ne 19-7s-11e (pb 2111)	60	2147

OLD WELLS DEEPENED

Fayette County—

Carter Oil, Harper 4, ne sw nw 17-7n-3e (otd 1551)	60	1562
Wood 8, sw nw sw 15-8n-3e (otd 1561)	16	1590

Wayne County—

Robinson et al, Osborn 1, nw ne nw 2-3s-8e (otd 3425)	45	3440

White County—

Sinclair-Wyoming & Ohio, Rudolph 9, se nw sw 12-6s-9e (otd 2275	88	2277

Indiana

Decatur County—

Hoosier Public Utility, Leimguber 221, c sw se 1-9n-9e	¶0.18	920

Gibson County—

Hyslop et al, Fee 1, sw nw ne nw 20-1s-9w	50	1674
P. W. Harr, Weber 1, nec sw 32-2s-9w	*	1789
Hall Edwards, Rc., Maier 3-A, se ne se 14-3s-14w	200	2519
Maier 18-C, ne se ne 14-3s-14w	55	2871
Amanta Maier 28-A, ne se nw 14-3s-14w	250	2533
Continental, Keck 22, ne nw sw 26-3s-14w	125	2808
Kleiderer 4, c nw ne sw 26-3s-14w	90	2804

Henry County—

T. Hutton, Fee 1, nec nw se 11-17n-9e	¶0.01	984

Knox County—

C. M. Lane et al, Morgan 1, c sw se sw 32-2n-9w	*	1758
Amerlangene, Moran 2, 75-3n-9w	*	865

Posey County—

Tide Water, Doll 5, nw nw ne se 33-3s-14w	69	2803
Harris & Myers, Daugherty 1, nec nw nw 1-4s-14w	*	2750

Spencer County—

Troy Ref. Co., Anderson 7, nw se ne ne 11-6s-4w	25	913

Starke County—

R. B. Tamblyn Dev., Francois 1, ne ne sw 5-32n-2w	*	1171

OLD WELLS DEEPENED

Posey County—

J. S. Roberts, Keck 1, c nw ne nw, 34-3s-14w (otd 2799)	25	2928

Kansas

Barton County—

Skelly, Weber 1, c s½ nw nw 13-16-12w	*	3390
Cities Service, Kosar 3, sw nw se 5-16-13w	3000	3381
Stanolind, Zugg 4, c e½ se nw 35-16-13w	*	3258
Shell, Burmeister 4, nec se 3-17-11w	3000	3320
Derby, Heinz 1, c w½ sw sw 10-18-11w	*	3392
Virginia, Clawson 3, c n½ sw nw 17-20-11w	288	3318
Hollow, Kowalsky 6, c w½ nw ne 18-20-11w	3000	3311

Butler County—

National Ref., North Lathrop 18, nec nw 17-23-4e	40	2114
Murfin et al, Sutter 1, se ne ne 7-28-7e	35	2658

Cowley County—

Trees, Rhodes 1, nw sw se 13-31-4e	*	3387

Ellis County—

Winkler-Koch 4, c n½ sw nw 21-11-17w	500	3410
Phillips, Carmichael 2, c n½ ne se 11-11-18w	3000	3377
Crow et al, Miller 1, c s½ sw sw 17-13-17w	482	3653

Ellsworth County—

Continental et al, Ploog "A" 6, ne sw 27-17-8w	3000	3225
Fuller 7, nw ne se 28-17-8w	512	3227
Gulf, Janssen 2, c e½ ne sw 29-17-10w	*	3332

Greenwood County—

M. C. Dunne et al, Kellar 2, c e½ e½ sw 22-26-13e	50	1485
Saco, Adams 2, ne se nw nw 27-26-13e	*	1459

Marion County—

R. E. Youker, Bucher 2, se sw ne 28-17-4e	249	2495
Ring-Mac, Novak 1, ne se ne 32-17-4e	365	2426
Hakej 1, c e½ ne sw 33-17-4e	235	2426

McPherson County—

Westgate-Greenland, Zietlow 4, c w½ se nw 19-17-1w	2134	2695
Continental, Conrad 1, se sw ne 31-19-5w	*	3486

Pratt County—

Beardmore, Kemp 2, c n½ ne nw 12-28-11w	3000	4258

Reno County—

Colorado Pet., Sabin 4, se se nw nw 13-23-4w	75	3384

Rice County—

Continental, Lansing "B" 9, ne se se 25-18-8w	431	3235
Bay, Keesling 3, c s½ ne sw 3-20-9w	120	3233

Rooks County—

Krueger, Tatkenhorst "B" 2, c n½ sw se 10-9-16w	1433	3241

Russell County—

Coralena, Phinney 7, c s½ ne ne 30-14-13w	61	2965
Aylward, Krug 1, ne 17-14-14w	*	3345
Hartman-Blair, Boxberger 5, se nw ne 26-14-14w (pb 3036)	416	3321
Gore, Michel 4, c n½ sw nw 36-14-14w	328	2950
Veeder, Hinderliter 4, sw se nw 33-15-13w	3000	3343

Sedgwick County—

Prunty, Black 4, ne sw nw 16-25-1e	899	3347

Stafford County—

Stanolind, Schartz 3, c e½ nw ne 13-22-13w	3000	3655
British-American, Meyer 3, se nw ne 28-23-12w	3000	3842
Phillips, Trethar 5, c s½ sw ne 12-24-11w	3000	3755
Stanolind, Nagel 1, c e½ ne sw 3-24-15w	410	4155

OLD WELL DEEPENED

Greenwood County—

Progressive, Loose 1, c nw ne 22-26-8e (otd 2005)	20	2424

Kentucky

Daviess County—

Cane Run Oil Co., Johnson 13	6	681
H. C. Farmer, Nation 7	4	1354
Master Oil Co., Richmond 11	*	1251

Ohio County—

J. C. Miller, Smith 23	10	327

South Louisiana

Acadia Parish (Jennings)—

George Michael, Clement 1	123	3861

Calcasieu Parish (Iowa)—

Stanolind, Gilson 1	340	9050

Cameron Parish (East Hackberry)—

Union Sulphur, Watkins 46	130	3197

Evangeline Parish (Ville Platte)—

J. K. Hughes, Ortego 4	432	10,237

Iberia Parish (Fausse Point)—

Sun, Planters 8	*	2317

Iberia Parish (Little Bayou)—

Texas Co., Decuir 4	115	6401

Iberville Parish (Bayou Blue)—

Superior, Grief Bros. 1	*	11,049

Iberville Parish (Bayou Choctaw)—

Louark Pet. Co., Wilbert 14	180	7938

Iberville Parish (St. Gabriel)—

Echols, Gueymard 1-A	203	7831

Jefferson Davis Parish (Woodlawn)—

Union Sulphur, Calcasieu Bank 7	210	9563

La Fourche Parish (Chacahoula)—

Texas Co., Drexler 1	*	6263

La Fourche Parish (Golden Meadow)—

Republic Pet. Co., Lefort 2-A	137	5173
Espagne 2	173	5490
Texas Co., LL&E 19	*	4496

La Fourche Parish (Leesville)—

Texas Co. LL&E 80	75	9194

Plaquemines Parish (Quarantine Bay)—

Gulf, State 26 QQ	296	8517

St. Mary Parish (Charenton)—

Goodwin & Lucy, Giles 7	21	949

North Louisiana

Caddo Parish (Pine Island)—

Texas Co., Herndon 11, 14-21n-15w	80	1665

Michigan

Allegan County—

Clapsadle & Harris, Schamtz 1, sw sw se 26-1n-14w	*	1329
Perry & Beach, Irwin 1, sw se se 4-4n-12w	*	1694
Jacob Bolema, Immink 1, ne ne sw 20-4n-14w	*	1716
Salem G&O Co., Funk 1, nw nw ne 14-4n-13w	130	1595

Arenac County—

Pure, State A-2, sw sw sw 15-19n-3e	*	4960
Don Rayburn, White 1, sw sw sw 24-19n-3e	145	2162
Rayburn & Major, Yenior 4, sw sw ne 22-19n-3e	510	2891

Bay County—

Chapman Oil Co., Nitsche 1, ne se se 33-15n-4e	25	2945

Clare County—

Freeman Oil Co., Woods 1, c n½ ne ne 34-20n-4w	*	4185

Gladwin County—

Sun, Goodwin 2, sw ne nw 36-17n-2w	14	3875

Isabella County—

J. W. McIntosh, Reakes 2, sw sw nw 15-16n-4w	*	3817
American Dr. Co., Jourdain 1, se nw nw 17-16n-3w	75	3743

Macomb County—

Johnson & Kellerman, Pohly 1, ne se se 22-4n-14e	*	3011

Midland County—

Pure, State-Porter 4, c n½ n½ se 15-13n-1w	68	3411

Monroe County—

Consol. Dev., Bragg B-2, se nw sw 30-6s-6e	45	2164

Montcalm County—

Belvidere Oil Co., Shale 1, c s½ n½ nw 20-12n-7w	*	1290

Osceola County—

Taggart Bros. Co., Campbell 12, c sw 19-18n-10w	¶11.5	1242

Ottawa County—

F. M. Douglass, McKay 1, ne ne nw 26-7n-13w	25	1865

Shiawassee County—

Lima Oil Co., Gladden 1, se ne nw 35-6n-2e	*	2175

Mississippi

Stone County (Wildcat)—

H. I. Morgan, Dantzler Lbr. Co. 2, 4-4s-10w	*	8507

Missouri

Holt County—

Flory & Kilby, Meyers 1, se ne nw 27-62n-39w	*	915

Montana

Fallon County (Cedar Creek)—

Montana-Dakota Utilities, No. 153, lot 1, 29-4n-62e	¶0.33	1480

Toole County (Kevin Sunburst)—

Glacier Prod. Co. Van Ormer 6, s s se 8-33n-5w	25	2908
Twinfield Oil Co., Government 3, ne ne ne 29-35n-3w	5	1793

Nebraska

Richardson County—

Ohio, Boice 2, c se ne 18-1n-16e	*	2320
Sandrock 7, nw ne sw 20-1n-16e	340	2236
Palinsky et al, Kalous 1, c sw sw 5-2n-13e	*	1956

New Mexico

Eddy County—

Danciger O&R, Turner 11-A, c se se 18-1s-31e	225	3390

Lea County (Maljamar)—

Barney Cockburn et al, Miller 2-B, c se nw 23-17s-32e	81	3800
Pearsall 8-A, c sw ne 33-17s-32e	796	4010
Johnny Cockburn et al, Miller 2-A, c sw sw 26-17s-32e	326	4170

New York

Allegany County—

Utter Oil Co., Richardson farm, Alma	5	1345
South Bolivar Oil Co., McKelvey farm, Bolivar	5	1431
Brothers Oil Co., Crandall farm, Bolivar	6	1381
Wm. Taylor Est., Reid farm, Alma	10	1385
Andrews Bros., Minnum farm, Alma	7	1429
Bradley Prod. Corp., Fitz-Carroll farm, Bolivar	6	1364
Putnam Oil Co., Fay farm, Bolivar	6	1428

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Jacob Trenkle Est., Hill farm, Genesee	5	1361
Cam Oil Co., Peavy farm, Genesee	4	1346
Forest Oil Co., Ackerman farm, Wirt	8	1379
Shaner Oil Co., Green farm, Genesee	6	1364
H. W. Patterson, Fuller farm, Scio	7	862
WATER INTAKE WELLS		
Allegany County—		
South Bolivar Oil Co., McKelvey farm, Bolivar	...	1336
Messer Oil Corp., Miles farm, Bolivar	...	1430
Bradley Prod. Corp., Duke farm, Alma	...	1438
Bradley Bros., Inc., Sawyer farm Bolivar	...	1326
New York Oil Co., Brown farm, Bolivar	...	1424

Ohio

Ashland County—		
Patrick et al, Dalton 1	*	644
Athens County—		
J. A. Wickers, Balderson 3	¶0.6	828
Bern O&G, Millemeir 1	*	982
Coshocton County—		
Lupher Dr. Co. et al, Hammond 1	*	3420
Knox County—		
Ohio Fuel Gas, Shoultz 1	¶0.28	2760
Lawrence County—		
Portage Producers, Cambria Clay Products 11	¶1.4	483
Ohio Fuel Gas, Ellis 1	¶0.08	2930
Licking County—		
G. S. Lacknett et al, Vanallen 4	¶0.06	735
Willard Gaudert et al, Holtman 1	*	3163
Lorain County—		
Ohio Fuel Gas, Pinckney 1	¶0.9	2685
Wiser Oil, West 1	¶0.25	2482
Medina County—		
Marine Tr. Co., Wertz 19-A	5	390
Packard 25-A	5	402
Packard 32-A	5	398
Packard 33-A	5	430
Packard 34-A	5	422
Packard 39-A	5	414
Packard 40-A	5	413
Preston Oil Co., Grim 2	*	550
Meigs County—		
Ohio Fuel, Nelson 3	¶1.32	937
Morgan County—		
W. S. Harns, Gilpin 1	¶0.42	1004
Muskingum County—		
Preston Oil, Ford 1	40	3450
Noble County—		
Garet & Moseley et al, Scott 2	2	590
G. M. Harper et al, Schafer 5	*	650
Clark Bros., Fogle 1	*	1032
Stark County—		
East Ohio Gas, Stambaugh 1	¶0.3	4647
Washington County—		
Henderson Oil Co., Dye Hrs. 40	5	650
Fifteen O&G, Schenkel 1	¶0.02	2020
Albert John et al, Seylor 1	*	915
INJECTION WELLS		
Medina County—		
Marine Tr. Co., Wertz 1-0	...	411
Packard 37-0	...	405
Packard 38-0	...	405
Packard 39-0	...	440
Packard 45-0	...	401

Oklahoma

Caddo County—		
W. F. Elliott, Pierce 5, sw sw se ne 22-2s-2w (pb 1178)	12	1486
Daube, Fee 3, sw sw nw sw 17-4s-2w	385	2224
Jones Oil Co., Guillot 1, se se sw se 18-4s-2w	*	2415
Neustadt, Choate 3, ne ne se se 18-4s-2w	288	2113
Choate 4, nw ne se se 18-4s-2w	480	2118
Choate (20) 4, ne nw 20-4s-2w	360	2005
Tidewater, Ward 1, ne ne se ne 19-4s-2w	715	2153
H. A. Earliewine, Ramsey 3, nw sw ne 36-4s-2w	*	3000
Creek County—		
A. J. Peters, Cohn 1, nwc sw 29-14n-7e	¶18.0	2860
Lewis, Jones 1, nw ne sw 32-15n-7e (pb 2850)	105	4101
Shamblin, Bruin 2, se sw nw 18-17n-11e	*	2803
M. L. King, Samuels 4, sw ne 35-17n-12e	*	1365
Deep Rock, Jones 3, nw se nw 26-18n-7e	¶1.4	1950
Bryan, Corbray 1, nec nw 34-19n-9e	*	2886
Hughes County—		
Olson Dr. Co., Jones 1, se sw se 5-5n-10e	28	4485
Jackson County—		
Caudell & Steere, Schoots 1, swc se 2-1n-20w	*	1705
Kriss, Inklebarger 2, ne sw sw 3-1n-20w	*	1602
Burke Royalty Col, Minor 9, sw ne ne 15-1n-20w	2	1549
Pierce & Eikner, Hardcastle 3, c se sw 15-1n-20w	55	1413
Kiowa County—		
Francis, Watkins 1, sw se sw 8-7n-17w	*	1639
Lincoln County—		
Elm, Bower 2, sw sw 1-15n-6e	*	4002
Marshall County—		
Pure, Thomas (202) 2, sw se nw 28-5s-7e	197	5092
Okfuskee County—		
Wells, Crawley 1, c nw nw 31-10n-12e	¶4.0	2010
Shell, Taylor 3, nw sw sw 26-12n-8e	665	3708
Anderson-Prichard, Stricklin 1, se ne se 27-12n-8e	50	3680
Phillips, Joney 4, nw ne ne 34-12n-8e	197	3663
Seran, Turner 1, ne sw ne 34-12n-8e	*	3715
Oklahoma County—		
Tower, Military 6, sw se ne nw 34-12n-3w (pb 6486)	229	6491
Osage County—		
Sunerior, No. 2, nw se sw 23-22n-8e	*	3078
Payne County—		
Crosbie, Hugle 1, sec sw 29-20n-2e	*	4840
Pottawatomie County—		
Willis et al, Spaugy 1, se nw nw 6-6n-4e	502	4277
Seminole County—		
Barnsdall, Bruner 4, c s½ se sw 2-9n-5e	*	3550
Amerada, Harris 1, c s½ nw sw 30-9n-6e	*	4379
Anderson-Prichard, Lincoln 1, se ne nw 33-9n-6e	*	2576
Stanolind, Palmer 1, nw sw nw 33-9n-8e	330	4394
Droppleman, Deere 1, ne se se 3-11n-8e	*	3624
Tillman County—		
I. T. I. O., Dickey 8, csl se ne nw 1-3s-19w	1566	5021
Tulsa County—		
Plymate et al, Grayson 1, sw sw nw ne 28-19n-10e	*	2121
J. C. Elledge, McKee 1, c nw 7-19n-11e (pb 1425)	10	1715
OLD WELLS DEEPENED		
Caddy County—		
English Dr. Co., McKenna-Grogan 1, ne ne sw se 11-5n-9w (otd 2400)	25	3400
Stephens County—		
Cities Service, Surber 15, ne sw se sw 33-1s-8w (otd 1674)	110	2313

Pennsylvania

BRADFORD DISTRICT

Penn Valley Crude Oil Corp., Fee	2	....
C. M. & F. J.e Lippert, Fee	4	....
Forest Oil Corp.	1	....
Forest Pet. Corp.	1	....
Niagara Oil Corp., 7 wells	7	....
Lloyd & Hardy, Meehan	2	....
Bradford Tr. Co., 19 wells	19	....
WATER INTAKE WELLS		
Messer Oil Corp., Loop	...	....
Forest Oil Corp., 2 wells	...	....
Forest Pet. Corp., 2 wells	...	....
Niagara Oil Corp., 3 wells	...	....
E. H. Culbertson, Wright	...	....
D. Y. M. Corp. No. 3, Bing 466	...	....
NEW YORK-PENN GAS AREA		
G. L. Cabot, Collins	*	....
Belmont Quad. Dr. Corp., Hildreth	*	....
MIDDLE DISTRICT		
D. B. McCalmont, Davis	1	....
Exchange Bank & Tr. Co., Whieldon	1	....
South Penn Oil Co., Smith & Grace	1	....
BUTLER-ARMSTRONG DISTRICT		
John Moon, Fee	1	....
SOUTHWEST DISTRICT		
Allegheny County—		
Baumgartell et al, McPherson 3	¶0.04	717
McCaslin et al, Harper 1	*	750
Armstrong County—		
James Wright, Fee 1	¶0.17	3508
Equitable Gas, Stett 1	¶0.09	3460
Clarion County—		
Owens-Illinois Glass, Steel 1	¶0.16	2620
Aites 1	¶0.02	3190
Greene County—		
H. B. Scott et al, Kovack 1	¶0.06	1475
Indiana County—		
T. W. Phillips, Johnston 1	*	3311
Washington County—		
Nat. Gas Co. of W. Va., Marshall 1	¶0.33	2933
Westmoreland County—		
Dome Gas Co., Wolford 2	¶0.1	3885
OLD WELL DEEPENED		
Greene County—		
Equitable Gas, Huffman 3566 (otd 3110)	¶0.03	3340

Southwest Texas

CORPUS CHRISTI DISTRICT

Bee County (Genevieve)—		
J. R. Dougherty, Hicks 1	*	4300
Bee County (Wildcat)—		
W. C. McBride & W. E. Rowe, Faktor 1	*	4769
Brooks County (Kelsey)—		
Magnolia, State-Marshall 5	750	4732
Brooks County (Wildcat)—		
Union, Chavana 1	*	6656
Calhoun County (Coloma Creek)—		
McSpadden Co., Clark 1-B	*	5951
Calhoun County (Wildcat)—		
Moore & Ahern, Moore & Innis 1	*	6210
Hidalgo County (Nichols)—		
Royal O&G Corp., Garcia Ld. & Livestock Co. 1	*	3898
Jackson County (La Ward)—		
Humble, Robbins 2	500	5233
Jackson County (Lolita)—		
Luling O&G Co., Seale 1	500	5933
Magnolia, Mitchell 11	450	5295
Mitchell 16	600	5292
S. Ward 9	600	5937
Jackson County (Lolita)—		
Magnolia, Ward 9	600	5937
Jackson County (West Ranch)—		
Magnolia, West 142-A	750	5566
Jim Wells County (East Premont)—		
Magnolia, Seeligson 15	550	5903
Jim Wells County (Wildcat)—		
Arkansas Fuel Oil Co., Brieger 1	*	5110
Jim Wells County (Wildcat)—		
J. H. Dunn, Kranicky 1	*	5503
Kenedy County (Wildcat)—		
101 Oil Co. & C. G. Newton, Kenedy 2	*	8000
Live Oak County (White Creek)—		
Douglas, Holland & Smith, Bonham 1	*	1753
Live Oak County (White Creek)—		
P. H. Korges, Adams 3	23	1550
Live Oak County (Wildcat)—		
Kilgore Developers, Kellmer 1	*	5312
Nueces County (Bentonville-King)—		
Southern Minerals, King 19-B	450	5206
Nueces County (S. Clara Driscoll)—		
Bryant & Saner, Rogers 4	350	6075
Rogeds 5	¶30.0 & 50	5619
Texas Cons. Oil Co., Flinn 8-A	500	4700
Wellington Oil Co., Martin 4	350	5272
Nueces County (Saxet)—		
North Star Oil Co., Morgan 5-E	¶20.0 & 50	7412
Nueces County (Stratton)—		
Southern Minerals Corp., Stratton-Community 14	550	6619
San Patricio County (White Point)—		
C. & R. Oil Co., Hunter 1	*	5985
San Patricio County (Wildcat)—		
P. G. Benedum, Jones	*	5420
Victoria County (Cologne)—		
Houston, Schubert et al 1	¶20.0	2982
Victoria County (Victoria)—		
W. V. Hardin, Buckert, Jr. 1	350	3094
LAREDO DISTRICT		
Duval County (Charamousca)—		
Magnolia, D. C. R. C. 14	*	1961
D. C. R. C. 9	150	1540
D. C. R. C. 8	175	1569
Duval County (Driscoll)—		
Continental, Driscoll, Jr. Est. 64-A	750	3393
Duval County (Muralla)—		
E. R. Thomas Est., Parr 1	60	5025
Duval County (Hoffman)—		
Magnolia, Weil 4	*	3075
Duval County (N. Sweden)—		
Hiawatha O&G Co., Parr 31	¶20.0 & 100	5749
Jim Hogg County (Colorado)—		
Humble, King Ranch-Colorado 12-B	350	2940
La Salle County (Wildcat)—		
Barnsdall, Sager 1	*	5508
McMullen County (Wildcat)—		
C. E. Yoakum & J. W. Gorman, Ferguson 1	*	3327
Starr County (Rincon)—		
Continental, Slick Est. 44-B	97	4169
Slick Est. 20-A	150	4673
Starr County (Rio Grande City)—		
Sioux Oil Corp., Goodrich & Wood 11	35	1365
Webb County (Killam)—		
O. W. Killam, Garcia 11	102	2050
Webb County (Wildcat)—		
Durbin Bond et al, Lewis 1	*	1430
Zapata County (Wildcat)—		
Brogan et al, Montemayor 1	*	2507
Dulup Oil Co., Haynes 3	*	1380
SAN ANTONIO DISTRICT		
Burleson County (Wildcat)—		
Haven Oil Co. & T. F. Morrison, Lewis 1	*	6520
Caldwell County (Bee Creek)—		
Ralph R. Ogden, Miears 10-A	806	2191
Dimmit County (Carrizo)—		
Diamond Half Oil Co., Kirk 1	*	3120
Ranelia Oil Co., McKnight 1	*	2466

United States Well Completions—*Continued*

North Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Archer County (Hull-Silk)—		
Pet. Producers Co., Chauncy 1	960	3802
Archer County—		
A. P. Nicholson et al, Matlock 2	*	670
Young-Woody Dr. Co., Meade 3-B	40	961
Meade 4-B	50	965
Baylor County (Wildcat)—		
Amerada, Upshur CSL 1	*	5550
Baylor County (Mabelle)—		
British-American, Turbeville 8	59	2544
Baylor County (Rendham)—		
British-American, Green 1-A	69	3057
Featherston & Spragins, Green 2	100	3068
Baylor County (Seymour)—		
Harvey Dr. Co., Bowie Bank-Tide Water 1	*	2727
Clay County—		
Akin-Dimock & Costley, McInness 5-C	*	1252
Gorman & Norwood, Taylor 5, sec 43	*	1324
Taylor 6, sec 43	60	1141
Perkins-Cullum, Taylor 3-A	3	259
Stayton Oil, McGregor 1	40	1142
Cooke County—		
Harvey Dr. Co., Sicking 6	31	1308
Metzner & McKee, Henscheid 5	*	843
Whitfield-Pearson-Grimes, Sicking 11	264	1300
Jack County—		
Compton Oil Co., Henderson 4	*	398
P. F. Gwynn & Overby, Bowden 1	968	3184
Geo. E. Weber et al, Brannon-Smith 1	4	310
Montague County (Wildcat)—		
Seitz-Comegys & Seitz, Ritchey 1	*	6013
Montague County—		
Pure Oil, Keck 13-A	47	831
Wichita County (K-M-A Ellenberger)—		
Fain-McGaha Oil Corp., Griffin 1-A-E (pb 4365)	400	4469
Griffin 2-A-E	506	4390
Wichita County (K-M-A)—		
Bishop Oil Co., Waggoner Bros. 5-B	536	3893
Deep Rock, Hamilton 8	165	3937
Hammon, Hanlon & Buchanan, Fassett-Tuttle 35	592	3955
Tide Water-Perkins-Cullum, Mangold 5	720	3813
Pettit 28	408	3904
Wichita County—		
Griffith & Kern, Schlaffke-Reid 1	*	719
Hall-Jordan Oil Co., Warren 8	5	1375
W. E. Prod. Co., Glass 8	74	1324
White & Duncan, Waggoner Est. 9	20	1387
Wichita County (Wildcats)—		
C. E. Beavers & Jennings, Cooper-Huffines 1	*	1403
C. E. Morrison-L. Sikes, Wolf 1	*	2110
Wilbarger County (Fargo)—		
Amerada, Parker 1	696	3949
Anderson-Prichard, Flaniken 1 (pb to 3945)	480	4524
Snowden & McSweeney Co., Emmett-Gulf 1	*	4758
Wilbarger County—		
Christie-Hickman Dr. Co., Waggoner Est. 4	*	1932
Geo. T. Davis et al, Waggoner Est. 2	*	1582
Young County (Wildcats)—		
Paul Atchley et al, Olney 1	*	1023
L. V. Hull & Son, Young 1	*	1034
E. L. Orr et al, Laird 1	*	956
E. M. Remington et al, Fee 1	*	492
G. Willard Rich et al, A. Furr 1-A, sec 34	*	765
Young County—		
Ard & Hansen, Belknap Coal 1, sec 21	*	780
Burma Pet. Co., Dunagan 3	*	923
L. T. Burns et al, Rogers 9	124	898
Rogers 10	80	893
Horwitz & Oldom, Graham 20	9	589
Thos. Humphrey et al, Franklin 1	*	3845
W. F. Palmer et al, Campbell 1-B	*	1004
Morgan 2	9	930

Texas Gulf Coast

Company, Well and Location	Init. Prod. Bbls.	Depth
Brazoria County (Wildcat)—		
Stanolind & Gulf Vieman 1	*	9750
Brazoria County (Angleton)—		
Glenn McCarthy, Carr 1	188	10,653
Fort Bend County (N. Thompson)—		
H. M. Naylor, Hampil 5	166	7900
Harris County (Wildcat)—		
Pure, Chase Nat. 1	*	5523
Jefferson County (Fannett)—		
Gulf, Bordages 9	676	8363
Liberty County (Wildcat)—		
Chas G. Hooks, Lockin 1	*	9702
Matagorda County (Bay City)—		
Skelly, Cobb 21-C	315	8619
Matagorda County (Blessing)—		
Skelly, Yeagley 1	*	9594
Matagorda County (Markham)—		
Pan American, Hudson 1	*	3857
Waller County (Katy)—		
Humble, Loucks 1	¶	7541
Polk County (Segno Deep)—		
Humble, Kirby B-X-36	61	8194
Wharton County (Withers)—		
Texas Co., Pierce C-93	130	5375

West Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Cochran County (Slaughter)—		
Atlantic Ref., Boyd-Humble 10	758	5055
Magnolia, Woodley 4	763	4983
Osage Dr. Co., Moore-Honolulu 2-A	640	5058
Moore-Honolulu 3-A	607	5070
Moore-Honolulu 4-A	723	5072
Moore-Honolulu 2-C	337	5058
Ector County (Foster)—		
Continental, Johnson 8	369	4260
M. J. Delaney et al, Johnson-Conoco 5-A	1234	4130
Forest Dev. Corp., Moss 7-H	371	4270
Geo. P. Livermore, Johnson - Ohio 1-40	607	4150
Fred Turner Jr. et al, Addis 2-A	932	4125
Ector County (Goldsmith)—		
Gulf, Goldsmith 349	2126	4232
Ector County (North Cowden)—		
Cities Service, Rhodes 16	988	4150
Gaines County (Seminole)—		
Amerada Pet. Corp., Austin 1	552	5225
Hockley County (Slaughter)—		
Honolulu Oil Corp., Mallet 3-B-10	1099	5025
Slaughter 3-A, Lab 4	1228	4990
Slaughter 11-B, Lab 24	1429	5020
Magnolia, Maple Wilson 1	133	4955
Mid-Continent Pet. Corp., Mallet 2-B	1341	5028
Sid Richardson et al, Slaughter 20-B	834	4980
W. J. Richardson et al, Allison-Sun 2	558	4984
Stanolind, Slaughter 12-A, Lab 47	1217	5087
Mitchell County (Northwest)—		
F. W. Merrick, Strain 1-A	100	1738
Pecos County (Toburg)—		
Cardinal Oil Co., Tippett-Stanolind 5-K	9	538
Pecos County (Walker)—		
Cardinal Oil Co., White-Baker 1-G	81	2020
Runnels County (Beddo)—		
Art Tucker et al, Beddo 2	171	2358
Upton County (Gulf-McElroy)—		
Gulf, Crier-McElroy 51	347	2903
Upton County (McCamey)—		
Gulf, King Ranch 1-B	*	2801
Ward County—		
Gulf, Estes 144	551	2660
Hutchings 156	202	2763
Winkler County (Wildcat)—		
Stanolind-Westbrook-Thompson, Hendrick 1, sec 18	*	4000
Yoakum County (Wasson)—		
Aloco Oil Co., Johnson-Texaco 7	518	5272
Don Danvers et al, Willard 3-B	1225	5301
Denver Prod. & Ref. Co., Whittenburg 26	867	5132
Oil Dev. Co., Willard 1-759	335	5190
Shell, Baumgart 14-B	1021	5185

Texas Panhandle

Company, Well and Location	Init. Prod. Bbls.	Depth
Gray County—		
Cities Service, Walberg 9	125	3100
Coronada Oil Co., Davidson 1	360	3088
Gulf, Bowers 12-A	74	3170
King Oil Co., South Vallmert 10	200	3250
Texwell Oil Corp., Davidson 1	276	3071
Hutchinson County—		
Benonine Oil Co., Starnes 11	367	3197
Gulf & Panhandle Ref. Co., Dial 102	134	2970
Mid-States Oil Corp., Whittenburg 35-A	389	2861
Phillips Pet. Co., Cockrell 52	149	3015
Jordan 15	274	3007
Moore County—		
Phillips Pet. Co., Winter-Win 1	¶17.4	3107
Wheeler County—		
Alma Oil Co., Welch 1	*	2340
Magnolia, Koons 3	97	2455

East Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Kilgore Area—		
Tom Humphrey et al, Spears 31 (20.37-ac)	900	3546
J. J. Jenkins et al, King 5 (1¾-ac)	400	3547
Shell, Watson 93 (385.2-ac)	2200	3694
Sinclair Prairie, King 29-B, Tr. 5 (147-ac)	2500	3474
Longview Area—		
Gen'l American Oil Co.-W. L. Kistler, Adams 31 (103-ac)	5600	3600
Mudge Oil Co., Richardson 5-B (33-ac)	2400	3731
Tide Water, Christian 10 (49.87-)	3000	3604
Anderson County Long Lake)—		
Tex-Harvey Oil Co., Cartmell 1 (605-ac)	365	5384
Anderson County (Wildcat)—		
Texas Co., Greenwood 1-A	*	5198
Franklin County (Talco)—		
Magnolia, Rutherford 4 (60-ac)	51	4240
Henderson County (Opelika)—		
Lone Star & Shamrock, Tullos-Pure 1	¶250.0	8231
Houston County (Grapeland)—		
Geier Bros. Inc. & F. B. Jackson, Guice 1-B	¶108.0	6030
Pridgeon 1	¶125.0	5957
Limestone County (Tehuacana)—		
Zephyr Oil Co., Peeples 6 (494-ac)	¶5.2	2647
Yelverton 3	*	2733
Navarro County—		
W. L. Barrett et al, Mahaley 1	*	1255
Wood County (Hawkins)—		
General Am. Oil Co., Moore 1, lot 16	449	4807
F. R. Jackson & Ashcroft, Hawkins School 1	520	4812
OLD WELL DEEPENED		
Gregg County (Kilgore)—		
Shell, King 9 (57.27-ac) (otd 3612) water input	...	3790

West Central Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Brown County—		
Hou-San Oil Co., Sewalt 2	40	953
Callahan County—		
F. Cann & V. Wagley, Diller Bros. 1	*	434
Coleman County—		
H. Mace et al, Reeves 1	*	185
Comanche County—		
St. John & Choate, Smith 12	11	636
Eastland County—		
Dobbs Oil Corp., Thomason 3	50	2632
J. O. Fox & Bells-Wells Oil Co., Vaughn 2	40	2662
Jones County (Wildcat)—		
Harry Hines et al, Wimberly 1	216	2553
Shackelford County—		
Hickon P&D Co.-Harry Reynolds, Nail 12-A	*	1692
C. J. Myers et al, Elliott 1	*	870
R. H. Roark et al, Elliott 2	6	816
Ungren-Frazier et al, Elliott 1, sec 19	*	980
McCulloch County (Wildcat)—		
R. E. Clark et al, Lively 1	*	991

West Virginia

Company, Well and Location	Init. Prod. Bbls.	Depth
Harrison County—		
Delaware Gas, Davis 2	¶0.12	3359
Kanawha County—		
Pure, Fee 1	¶0.13	1797
Owens-Libby-Owens, Siler Coal 10	¶0.1	3747
Lincoln County—		
Lincoln Land & Mineral, Evans 2	¶0.08	2324
F. H. Yates, Stroudt 2	*	2188
Marshall County—		
Guy B. & H. G. Patterson, Gray 2	¶	684
Monongalia County—		
Penn Illinois O&G, Gump 1	*	2360
Putnam County—		
Summit Gas, Burdette 3	¶0.09	2371
Jackson Gas, Rupe 3	*	1550
Ritchie County—		
D. A. Cronin, Goff 2	¶.038	1920
Kight & Mackey, Mackey 7	¶0.26	1579
Roane County—		
Jeff Miller et al, Pritchard 1	*	1625
Gerald D. Jones, Church 1	*	1835

Wyoming

Company, Well and Location	Init. Prod. Bbls.	Depth
Niobrara County (Lance Creek)—		
Continental Oil, Schuricht 2-A, se ne 6-35n-65w	397	5453
Ohio Oil, Putnum 19, c w½ w½ nw 4-35n-65w	256	5490
OIL WELL DEEPENED		
Niobrara County (Lance Creek)—		
Continental Oil, Rohlff, se nw 32-36n-65w (otd 3967)	22	5165

Ask New Designations for Nichols Field, Hidalgo County

In an effort to obtain new field allowable designations, Baldridge & King have requested that each of four producing sands in the Nichols field, Hidalgo County, be treated as separate reservoirs. Production is found at 3500, 3650, 3700 and 3800 feet.

At a hearing before the Texas Railroad Commission last week, operators said there are four wells in the field, producing from the 3500- and 3650-foot sand. Other sands now are not producing. They asked that the commission grant new field allowables for all wells until five wells had been drilled to each of the sands in the field.

The commission recently announced a policy which gives a bonus to new discoveries. New fields are given a higher allowable for four months after the first well is completed, or until five wells have been completed.

WILDCAT REPORT
New Starts and Completions

CALIFORNIA
FIRST REPORTS

Kern County—Chanslor-Canfield Midway Oil Co.'s Famosa 12-1, sec 12-27-26, lcn, Famosa area. White River Explor. Co.'s Salsa 2, sec 8-25-28, rig, Richgrove area.

Orange County—Sierra Pet. Co.'s Cole 1, sec 2-3-11, lcn, Whittier-LaHabra area.

Sacramento County—Standard's Orland 1, sec 9-3-3, lcn, Rio Vista area.

COMPLETIONS

Fresno County—Texas Co.'s S. P. 27-13, sec 13-17-15, td 9673 ft, pb 9365 ft, Kreyenhagen 7870 ft, Hondo 9075 ft, formation test recovered mud & water, abnd, Cantua Creek area.

Kern County—Ebert E. Smith's Smithhart 1, sec 34-30-22, td 2339 ft, no casing, 90 ft tar sand above 1100 ft, abnd, McKittrick area.

KANSAS
FIRST REPORTS

Barber County—Pryor & Lockhart et al's Ishmael 1, c s½ se sw 35-34-11w, dr.

Harvey County—Winkler-Koch et al's Kaufman 1, c e½ ne ne 8-22-1w, dr.

Marion County—Basinger & Fowler's Janseen 1, nec se 9-21-3e, dr.

Sedgwick County—C. L. Carlock et al's Whitson 1, c w½ nw sw 25-25-2e, dr.

Stafford County—W. P. Faulkner et al's Ward 1, c e½ se sw 21-21-13w, dr.

Russell County—Central Pet. Co. et al's Machin 1, c e½ ne nw 9-13-14w, rur.

COMPLETIONS

Butler County—Rex & Morris et al's Matthews 2, ne se nw 26-28-6e, 3 mi e Pettit pool, Kansas City 2215 ft, abnd 2885 ft.

McPherson County—Westgate-Greenland Oil Co.'s Chindberg 1, c w½ nw se 18-18-1w, between McPherson and Roxbury pools, Mississippi Chat 2841 ft, abnd 2870 ft.

Woodson County—Phillips' Wix 1, se ne se 31-25-15e, 3 mi sw Yates Center pool, abnd 1525 ft. Phillips' Fidelity 1, sw nw ne 4-26-15e, between Yates Center and Big Sandy pools, abnd 1591 ft.

MICHIGAN
FIRST REPORTS

Allegan County—H. L. Wheeler's Sebright 1, se ne sw 26-3n-13w, lcn.

Isabella County—Socony-Vacuum's Bandeen 1, c e se nw 22-13n-5w, rig.

Kent County—E. R. Roach's Holden 1, ne se ne 28-9n-11w, dr.

Ottawa County—Southwest Dev. Co.'s Oosterbroek 1, se se nw 3-5n-13w, rig.

COMPLETIONS

Allegan County—Clapsaddle and Harris' Schamtz 1, sw sw se 26-1n-14w, Traverse 1118 ft, abnd 1180 ft. Perry & Beach's Irwin 1, sw se se 4-4n-12w, Traverse 1688 ft, abnd 1694 ft.

Clare County—Freeman Oil Co.'s Woods 1, c n ne ne 34-20n-4w, Dundee 4036 ft, abnd 4185 ft.

Macomb County—Johnson & Kellerman's Pohly 1, ne se se 22-4n-14e, Sylvania 1390 ft, abnd 3011 ft.

Shiawassee County—Lima Oil Corp.'s Gladden 1, se ne nw 35-6n-2e, abnd 2175 ft.

MISSISSIPPI
COMPLETION

Stone County—H. I. Morgan's Dantzler Lbr. Co. 2, ne se 4-4s-10w, side-wall cores 7200-7300 ft, so, abnd 8507 ft.

MISSOURI
COMPLETION

Holt County—Brin & Nathan's Decker 1, c nw nw 1-61n-38w, Hunton 2212 ft, abnd 2311 ft.

SOUTH LOUISIANA
FIRST REPORTS

Calcasieu Parish—Hecate, Inc.'s Vincent 1, Rose Bluff prosp, sec 26-10s10w, lcn.

St. Mary Parish—Wm. Helis' Avoca, Inc. 1, Avoca Island pros, sec 45-16s-13e, lcn.

COMPLETION

St. Mary Parish—Texas Co.'s State 2, Cote Blanche Island, se flank, td 5454 ft, salt top 1909 ft, band.

NORTH LOUISIANA
FIRST REPORT

Winn Parish—H. R. Scivally's Crooks 1, ne ne sw 1-6n-4e, mat.

NEW MEXICO
FIRST REPORTS

Eddy County—K. H. Long et al's Prichard 1, nec ne 18-20s-26e, sp.

Lea County—Fullerton Oil Co.'s State 1, c ne se 18-16s-33e, cem sur pipe. Richmond Dr. Co. et al's State 1, c sw se 22-17s-33e, lcn 4800-ft test.

NEBRASKA
COMPLETIONS

Richardson County—Transcontinental Oil's Hebenstreit 1, c nw sw 8-2n-16e, 2 mi n Falls City pool, Howard 464 ft, Lansing 870 ft, base Kansas City 1150 ft, Mississippi 2108 ft, base Mississippi 2257 ft, Hunton 2498 ft, abnd 2559 ft. Henry Bollen et al's Bankers Life 1, c sw sw 30-3n-16e, 1 mi w Shubert pool, Lansing 948 ft, Mississippi 2154 ft, Hunton 2515 ft, td 2521 ft, 500 gals butane, 420 gals acid, 187 bbls 30-gr.

OKLAHOMA
FIRST REPORTS

Beckham County—Western Okla. O&G Co.'s Ward 1, se ne se nw 27-9n-24e, dr.

Grady County—W. H. Atkinson et al's Jelks 1, nec se 22-5n-7w, otd 4005 ft, to dd.

Logan County—Continental et al's Lenigar 1, sw se sw 17-15n-3w dr.

Osage County—C. S. Miller et al's Osage 2, sw ne sw ne 18-24n-8e, testing.

Pottawatomie County—Atlantic et al's School Land 1, c e½ ne sw 16-9n-4e, drk.

COMPLETIONS

Creek County—Lewis Prod. Co.'s Jones 1, nw ne sw 32-15n-7e, new pay, East Stroud pool, Prue 2830 ft, Wilcox 4101 ft, td 4101 ft, pb 2850 ft, shot 80 qts, 105 bbls.

Love County—N. H. Martin's Porter 1, sw ne se 19-6s-3w, 12 mi w Stockton pool, abnd 1623 ft in shale.

Okfuskee County—Sunray's Spillman 1, sw nw nw 4-10n-9e, 4 mi sw Okemah pool,

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Henryetta Coal 1755 ft, Senora sd 1797-1880 ft, Gilcrease sd 3087-3208 ft, Cromwell zone 3381 ft, abnd 3485 ft.

Okmulgee County—Viersen O. & G. Co. et al's Tilt 1, sec 4-15n-12e, N Beggs dist, Bartlesville 1570-1690 ft, water, Mississippian 2360 ft, Viola 2527 ft, Wilcox 2627 ft, abnd 2659 ft.

Osage County—Superior Oil Co.'s Osage 2, nw se sw 23-22n-8e, 1½ mi se Hominy pool, Oswego 2086-2151 ft, Pink li 2254-62 ft, Redfork 2264-2412 ft, Bartlesville 2457-68 ft, Mississippi chert 2620 ft, base Mississippi 2853 ft, Hominy 2851-71 ft, Arbuckle 2971 ft, abnd 3078 ft.

Payne County—Wood Oil Co.'s Daniel 1, sec 15-19n-3e, 2½ mi n Stillwater pool, Pawhuska 870 ft, Bird Creek 1020 ft, Deer Creek 1150 ft, Dewey 2645 ft, Hogshooter 2950 ft, Layton 2985-3020 ft, Checkerboard 3255 ft, Oswego 3495 ft, Bartlesville 3882 ft, Mississippi 4130 ft, Woodford 4230 ft, Misener 4255 ft, Mississippi Dolomite 4265 ft, Viola Dense 4330 ft, Dolomite 4345 ft, First Wilcox 4361 ft, Second Wilcox 4394 ft, abnd 4405 ft.

Pottawatomie County—Eason Oil Co. et al's Royster 1, sw nw nw 33-6n-3e, 2 mi sw West Asher pool, Belle City 2459 ft, Hogshooter 2804 ft, Layton 2871 ft, Checkerboard 3035 ft, Wanetle sd 3619 ft, Unconformity zone 3664 ft, Horrigon li 3699 ft, td 3753 ft, pb 2894 ft, perf 12 holes 2869-78 ft, 3,540,000 ft gas, cp 1500 lbs.

Seminole County—J. T. Miller et al's Parsons 1, swc nw 29-11n-6e, 1 mi ne East Shawnee pool, Belle City 1200 ft, Hogshooter 1860 ft, Checkerboard 2220 ft, Oswego 3030 ft, Calvin 3045 ft, Brown li 3870 ft, Caney 3990 ft, Mayes 4230 ft, Woodford 4360 ft, Misener 4389 ft, Hunton 4395 ft, Sylvan 4560 ft, Viola 4649 ft, Dense 4680 ft, First Wilcox 4729 ft, Second Wilcox 4801 ft, abnd 4811 ft.

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WICHITA FALLS, TEXAS

SOUTHWEST TEXAS

FIRST REPORTS

Duval County—Bridwell Oil Co.'s Escapole 1-B, GH&H sur 75, 7 mi e Freer, ru for 3300-ft test, Gorman Yoakum Dr. Co., cont.

Jim Wells County—Magnolia's Seeligson Unit 3-1, sec 61, R. P. Haldeman subd of Seeligson ranch, 3 mi nw Premont, dk for 5050-ft test, company rig.

Karnes County—Ralph E. Fair, Inc.'s John Hancock Mutual Life 1, William Evans sur, 12 mi ne Helena, dr below 500 ft on 2500-ft test.

Milam County—Marshal A. Hayes, Jr.'s Donaldson 1, W. L. Hannum sur, 3½ mi e of Burlington, mir for 1900-ft test.

Starr County—Navarro Oil Co.'s Domingo L. Garza 1, ACH&B sur 163, w of Rincon fld, loc for 5500-ft test.

Victoria County—Houston Oil Co. of Texas' Wood 1, East Telferner fld, 5 mi se Telferner, lcn.

Willacy County—Pan-American Prod. Co.'s Burgess 1, Willamar fld, 1 mi sw disc at Willamar, lcn for 8000-ft test.

Zapata County—J. W. Kunetka's Trevino 1, McCullough subd of sh 1 El Grullo gr, 15 mi sw Randado, lcn for 1500-ft test.

COMPLETIONS

Bee County—W. C. McBride, Inc.'s Faktor 1, G. Garcia gr, 2 mi n Tynan, abnd 4769 ft.

Brooks County—Union Oil Co. of Calif.'s Chavana 1, La Encantado gr, 3½ mi se Alta Mesa, abnd 6656 ft, electric log 6656 ft.

Burleson County—Haven Oil Co. & T. F. Morrison's Lewis 1, C H. Bennett lge, 7 mi nw Clay Creek fld, abnd 6520 ft, electric log to 6510 ft.

Calhoun County—Moore & Ahern's Moore & Innis 1, Miguel Castillo sur, 1½ mi n Seadrift, abnd 6210 ft, stuck drill pipe at 6050 ft, sidetracked and dr to td.

Duval County—Hiawatha O&G Co.'s Parr 31, San Andres gr, gas and dist well at 5749 ft, ext N Sweden fld 250 ft se, E. R. Thomas Est.'s Parr 1, J. Adams sur 1, 52.04 bbls, 7/32-in ch, 1000 lbs tp, 1800 lbs cp, td 5025, sand topped 4708 ft, extends Muralla fld 1 mi east.

Jackson County—Humble's Robbins 2, B. J. White lge, comp for 173.2 bbls, ¼-in ch, 225 lbs tp, 525 lbs cp, td 5233 ft, 5½-in casing 5210 ft, sand 5228 ft, extends LaWard fld 2/3-mi northeast.

Jim Wells County—Arkansas Fuel Oil's Brieger 1, SA&MG RR sur 125, 1½ mi w Orange Grove townsite, abnd 5110 ft, ran electric log, J. H. Dunn's Kranicky 1, GH&H sur 111, 3 mi se Orange Grove, abnd 5503 ft, electric log.

Kenedy County—101 Oil Co. & C. G. Newton's Kenedy 2, Jose Antonio Leal de Leon gr, 8 mi sw Mifflin, abnd aprox 8000 ft.

La Salle County—Barnsdall's Sager 1, AB & M sur 903, 2 mi nw Atlee, abnd 5508 ft, electric log.

Live Oak County—Kilgore Developers, Inc.'s Killmer Est. 1, Nueces County School Land sur, 3 mi s La Garto, abnd 5312 ft.

McMullen County—C. E. Yoakum & J. W. Gorman's Ferguson 1, BS&F sur 104, 25 mi ne Freer, abnd 3327 ft.

Webb County—Durbin Bond et al's Lewis 1, 160 ac lse, 1 mi w Mirando City, abnd 1430 ft.

Zapata County—Drogan et al's Montemayor 1, sur 63, 2 mi sw Escobas, abnd 2507 ft. Dulup Oil Co.'s Haynes 3, Alice D. Haynes subd of Villa gr, 15 mi s Escobas, abnd 1380 ft.

NORTH TEXAS

FIRST REPORTS

Archer County—C. W. Snoddy et al's Carter 1, sec nw lot 38, blk 5, Clark-Plumb sur, lcn.

Grayson County—Robt. Talbot and Albert Fenston's Jewell 1, c of sw 20 acres of 159-ac tract, Wm. Allen sur A-15, mim for 5000-ft test.

Throckmorton County—Jimmie C. Rogers et al's Timmons 1, nwc s½ TE&L sec 2189, 3½ mi w Elbert, rig for 4200-ft test.

COMPLETIONS

Baylor County—Amerada Pet. Corp.'s Upshur 1, near center 4983-ac lse, and tr 3, Upshur CSL sur A-557, top Ellenberger 5507 ft, abnd 5550 ft.

Clay County—Shell's Coleman 1-A, nec blk 24, Calhoun CSL sur, new pool and first Mississippian production in county, Bend 5832 ft, Mississippian 6126 ft, Viola 6397 ft, Simpson 6455 ft, Ellenberger 6727-6837 ft, pb and perf 6158-6283 ft, flowed 138 bbls 47-gr oil nat 3 hours on ¾-in ch.

Montague County—Seitz-Comegys & Seitz, Inc.'s Ritchey 1, nec s½ lbk 66, M. Garnett sur, 1½ mi se Belcherville, Bend 5550 ft, Simpson 5763 ft, Ellenberger 5819 ft, abnd 6012 ft.

Wichita County—C. E. Morrison & L. Sikes' Wolf 1, blk 49, Red River Valley Lands, water sand 1857-1956 and 2062-88 ft, abnd 2110 ft. C. E. Beavers & Jennings' Cooper-Huffines 1, blk 3, H. Hastie sur A-98, abnd 1403 ft.

Young County—Paul Atchley et al's Olney 1, se nw TE&L sec 230, abnd 1023 ft. L. T. Burns et al's Larimore 1-A, nec w½ TE&L sec 150, mile n of Orth, Gunsight 884-85 ft, Canyon 1577 ft, Bend 4155 ft, Marble Falls 4395 ft, Mississippian 4797 ft, Mississippian pay 4897-4927 ft, flowed 835 bbls 46-gr oil 12 hrs nat ¾-in ch. L. V. Hull & Son's Young 1, nec s½ TE&L sec 1496, abnd 1034 ft. E. L. Orr et al's Laird 1, se sw TE&L sec 1393, abnd 956 ft. E. M. Remington et al's Fee 1, J. W. Peveler sur, abnd 492. G. Willard Rich et al's Furr 1-A, nw ne TE&L sec 34, abnd 765 ft.

EAST TEXAS

FIRST REPORTS

McClennan County—Chas. Mooney et al's Herblin 1, w cor 91-ac tr, T. J. Chambers sur, Georgetown 540 ft, Glen Rose 1000 ft, dr 1130 ft.

Red River County—Geo. C. Foster et al's Edmondson 1, 100½-ac tr, Daniel Perkins sur, lcn.

Upshur County—L. S. Buchanan et al's Robinson 1, sw part of 167-ac tr, John Sanders sur, lcn.

COMPLETION

Anderson County—Texas Co.'s Greenwood 1-A, se part of 377-ac lse, Maximo Salisar sur, Keechi Dome, elev 338 ft, Pecan chalk 3107-37 ft, Austin chalk 4257-90 ft, Woodbine series 4815 ft, abnd 5198 ft.

WEST TEXAS

FIRST REPORT

Pecos County—H. L. Cain & Sam G. Dunn's Downs 1, ne se H&GN sec 105, blk 8, lcn.

COMPLETION

Winkler County—Stanolind & Westbrook-Thompson Hold. Corp.'s Hendrick 1-A, c nw nw PSL sec 18, blk B-26, abnd in water at 3915-4000 ft.

WEST CENTRAL TEXAS

FIRST REPORT

Eastland County—Sabens & West's Hall 1, ne¼ H&TC sec 100, blk 3, lcn 3500-ft test.

COMPLETIONS

Jones County—Harry Hines et al's Wimberly 1, swc blk 87, DeWitt CSL sur, Leag 126, lime 2537 ft, pay 2538-53 ft, used 1000 gals acid, flowed 216 bbls oil initial, ½-in ch.

McCulloch County—R. E. Clark et al's Lively 1, sec blk 931, H. F. Helzfeldt sur, Ellenberger 945 ft, abnd 991 ft.

TEXAS GULF COAST

FIRST REPORTS

Brazoria County—Glenn H. McCarthy's Triangle Dev. Co. 1, s cor of 230-ac tr, Hooper & Wade sur 3, A-428, ¾ mi nw of Chocolate Bayou and se Rowan fld, tent lcn.

Fort Bend County—Providence Oil Co.'s Hatfield 1, 2 mi w Clodine, H. D. Brown sur, appx cent 375-ac tr, rig for 8000-ft test.

Harris County—E. R. Kirkpatrick et al's Schoneman 1, ne Bammel fld, dk for 6500-ft test.

COMPLETIONS

Brazoria County—Stanolind & Gulf's Vieman 1, 3 mi w Chenango, 10¾-in 1924 ft, abnd 9750 ft.

Harris County—Pure's Chase Nat. Bank 1, John Sellers sur in ne cor of co. 8⅝-in csg 1319 ft, abnd 5523 ft, no show in Frio.

Liberty County—Chas. G. Hooks, Tr's Lockin 1, ½-mi n of Hightower, Spencer Kirkham sur, 10¾-in 1847 ft, Wilcox 8914 ft, gas-dist in upper part, abnd 9702 ft, ran elec log.

Twenty-Acre Spacing For Bean Field

Twenty-acre proration units and wells spaced 440 feet from lease lines and 880 feet apart is required in a Texas Railroad Commission order for the Bean field, Crockett County. If the operators elect to drill one well to 40 acres, they may receive the acreage allowance, providing the wells are at least 1320 feet apart. A maximum of 50 acres is assignable to the last well drilled on these units.

Proration is on acreage and per well, with 75 percent distributed on acreage. Rules call for surface casing set through the Trinity water sand, or a minimum of 450 feet, and cemented to the surface, and an oil string set with 35 sacks of cement.

Turkey Creek Repressuring

Renwar Oil Corporation has been given permission to operate a gas repressuring system in the Turkey Creek field, Nueces County. For the next 90 days, the company is permitted to inject a maximum of 3,000,000 feet of gas daily into the Douglas sand.

MEN IN THE INDUSTRY'S NEWS

JOHN A. RITTER, general superintendent of production for Sun Oil Company in the Dallas division, has been assigned additional executive duties since the recent death of M. B. Sweeney, who was general superintendent for more than a decade, and will have Robert L. Marston as assistant production superintendent. Ritter, a graduate engineer, started with the company January 10, 1923, and has resided in Dallas since January, 1930, when he became assistant general superintendent. Marston has been with the Sun Oil Company and affiliated companies for for more than a score of years. He is a graduate geologist, and in October, 1920, became chief geologist and manager of operations of Beacon-Sun Oil Company in Venezuela. When the Sun Oil Company disposed of its Venezuelan holdings, Marston was transferred to Texas to supervise important wildcat projects, including the Marquez Dome explorations, Leon County, in 1931-32. Similar assignments followed in California and Washington. He was with Sperry-Sun Well Surveying Company at Houston for a year, to July, 1939, then rejoined Sun Oil Company as superintendent of the Rio Grande district with headquarters at McAllen, Texas.

J. A. Ritter

R. L. Marston

Production activities of the Dallas division of the Sun Oil Company have been divided into three major districts. M. L. Brown, Kilgore, is superintendent of District 1, with B. M. Givens, Arp; D. B. Kiniry, Kilgore, and H. C. England, Gladewater, as superintendents of their respective sectors of the East Texas field, and T. Jerry Sweeney, Kilgore, as superintendent of East Central Texas, including North Louisiana. England was formerly superintendent at Brenham, and Sweeney held a similar position at Odessa.

R. L. English is superintendent of District 2, with headquarters at Corpus Christi, with C. L. Nolan, Alice, superintendent of the Mirando district, B. C. Broocks, McAllen, formerly superintendent at Beeville, superintendent of Rio Grande district, and R. C. Eubank, Beeville, is foreman in charge of the Beeville-Lockhart district.

Gene E. Sweeney, former Longview district superintendent with headquarters at Gladewater, has been transferred to Dallas as superintendent of District 3. J. L. Patterson, Big Spring, and W. V. McArthur, Pampa, will continue as superintendents of their respective districts.

H. L. Parks, former East Central Texas superintendent, will be superintendent of Odessa, embracing Northwest Texas and New Mexico operations. P. S. Dudley will be foreman in charge of the Brenham district, succeeding England.

STANLEY B. WHITE, geologist for the Ohio Oil Company, announced the annual picnic and dance of the Tulsa Geological Society will be held May 3rd at Woolaroc Lodge, through the courtesy of Frank Phillips, board chairman of Phillips Petroleum Company. Grounds will be open to the society at 2 p. m. Facilities will be provided for horse shoe pitching, soft ball, boating, and swimming. A dance will follow the supper.

RAY E. MILLER Hanlon-Buchanan, Inc., Tulsa, was elected president of the Natural Gasoline Association of America during the organization's annual meeting held in Dallas last week. Other officers named were J. R. Jarvis, Lone Star Gasoline Company, Shreveport; H. A. Ells, Cities Service Oil Company, Bartlesville, and J. W. Viaden, Skelly Oil Company, Tulsa, vice presidents. The Hanlon award went to Alois Kremser, assistant manager of research for Standard Oil Company of California, San Francisco.

GEORGE SCHANZ, 63, vice president of Evangeline Iron Works, Vinton, Louisiana, since organization of the company in 1908, died April 20 following a stroke. He had been in ill health for a year.

ALBERT CARLISE, geologist with C. L. Maguire, Inc., for the past three years, has resigned to enter business at Port Huron, Michigan.

JOHN M. POST, manager of Oil Well Supply Company's Eastern Division since 1929, has been appointed manager of the company's Tubular Goods Department, with headquarters at Pittsburgh, serves all of "Oilwell's" sales divisions. He joined the company in 1905 at the Washington, Pennsylvania store. In 1909, he transferred to Beaumont, Texas, and for the next 20 years was associated with the company's Gulf Coast and Mid-Continent activities. Post first served as a district manager in 1915 at Houston, and subsequently held similar positions at Shreveport and Tulsa, moving from the latter point to Oil City, Pennsylvania, in 1929 to become manager of the Eastern Division.

F. L. MARTIN, vice president and director of Sunray Oil Company, was elected to the directorate of Sunray Oil Corporation at the latter firm's annual stockholders' meeting in Wilmington, Delaware, April 14. He was elected to fill a vacancy, and other directors were re-elected.

M. J. EGAN and I. C. Lawless have been named vice president and general manager and general sales manager, respectively, for Bridgeport Machine Company, Wichita. Egan, former controller and office manager of the company, started in the oil business as a tool dresser and cable-tool driller in the Mid-Continent. He joined Bridgeport Machine Company 18 years ago as a blacksmith's helper,

Oil Personalities . . .

CLARENCE T. SMITH

RECENTLY appointed by Governor Dwight H. Green to represent Illinois on the Interstate Oil Compact Commission, Clarence T. Smith is an attorney who since 1936 has devoted practically his full time to oil legal work and a study of oil problems. He is a large holder of non-operating interests in Illinois.

Born at Louisville, Clay County, Illinois, in 1902, he was educated in the public schools, graduating from the University of Illinois College of Law in 1925. He was admitted to the bar that year, and practiced law with his father, the late James H. Smith. In 1933, following his father's death, he formed the law firm of Smith & McCollum. He was elected state's attorney for Clay County in 1926, to be, at 24 years, Illinois' youngest state's attorney up to that time. He was re-elected in 1928. In 1927, he drafted and was instrumental in obtaining passage of an amendment to the Illinois Conservator's act to enable conservators to execute oil and gas leases.

Smith, who recently represented Governor Green at hearings conducted in Washington by the Cole subcommittee of the House Committee on Interstate and Foreign Commerce, is a director of the Independent Producers Association of Illinois, a member of the Illinois-Indiana Petroleum Association, and a director of the Independent Petroleum Association of America.

C. T. Smith

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MEN IN THE INDUSTRY'S NEWS

M. J. Egan

I. C. Lawless

was shortly transferred to the cost accounting department, and progressed through the ranks to office manager. Lawless was formerly sales promotion manager.

DR. JOSEPH A. SHARPE, chief psysicist for the joint geophysical laboratory of Stanolind Oil & Gas Company and Western Geophysical Company at Tulsa, recently gave three lectures in geophysical exploration under the sponsorship of the Department of Geology of Massachusetts Institute of Technology.

C. P. PARSONS, vice president of Halliburton Oil Well Cementing Company, will discuss "Current Practices and New Developments in Cementing Oil Wells," before the Engineers Club of Tulsa at its regular noon luncheon meeting April 28, to be held in Michaelis Cafeteria.

E. R. BROWN, Dallas, board chairman of Magnolia Petroleum Company and vice chairman of Socony-Vacuum Oil Company's board, was elected a Phi Beta Kappa associate at the spring directors' session of the Phi Beta Kappa Association.

C. E. ANSTIE, vice president of Shell Oil Company of British Columbia, was recently elected to the executive committee of the British Columbia division of the Canadian Manufacturers' Association.

T. O. CRISWELL, in the scouting department of The Carter Oil Company at Tulsa, has been transferred to Saginaw as scout for that area under Lee Lamar, Michigan geologist for the company.

JOHN D. STEELE, chief clerk in the Fort Worth district office of Stanolind Pipe Line Company, has been temporarily transferred to Tulsa headquarters as an assistant to Vice President W. L. Heltzel.

SAM WEINER, West Texas producer and drilling contractor with residence at Fort Worth, is recovering from injuries sustained in an auto mishap.

JAMES PARKER, Fort Worth representative of Arrow Drilling Company, Tulsa, has been called for military duty as a major in the United States Cavalry Reserves at Fort Sam Houston.

IVAN G. BURELL, former production superintendent at Owensboro, Kentucky, for The Ohio Oil Company, has been transferred to Marshall, Illinois, where he is division petroleum engineer.

J. J. CONRY, retiring president of The Carter Oil Company, was honored by company officials and supply firm representatives at a banquet held in Tulsa last week. Before the dinner, which was attended by more than 300, a reception was held to honor the following officials of the Standard Oil Company of New Jersey: E. J. Sadler, E. Holman, F. W. Pierce, T. R. Armstrong, E. J. Johnson, W. E. Pratt, F. W. Abrams, N. Clarey, W. R. Finney and J. L. Cluley.

T. E. WEIRICH, geologist for Phillips Petroleum Company, Bartlesville; E. O. Markham, The Carter Oil Company, and Luther Kennedy, Tulsa, consulting geologist, lead a symposium discussion of "Occurrence of Oil and Gas in North and East Oklahoma and Eastern Kansas" before the Tulsa Geological Society last week.

F. W. ROBSON has accepted a position as assistant engineer with the White Eagle Division of Socony-Vacuum Oil Company at Wichita. A past president of the Engineers Club of Tulsa, he was formerly with The Carter Oil Company, Tulsa, as drafting department head.

W. A. REITER, Fohs Oil Company, Houston, addressed the Shreveport Geological Society April 17 on "Notes on the Origin of Oil."

M. J. FITZGERALD, oil operator formerly located at Tulsa, has moved to 601 National Standard Building, Houston.

F. J. Adams, left, general agent in charge of Fort Worth district operations of Gulf Oil Corporation, receives a 30-year service award from L. P. Garrett, Houston, senior vice president, at banquet held in Fort Worth April 19 for employes having 10 or more years' service. Glen Garrett, head of the Fort Worth district land and scouting department, and William Johnson and E. D. True, of the Gulf Refining Company, were also honored with 30-year diamond-studded pins. Total of 264 employes in the Fort Worth district received service awards, with banquets held at Amarillo, Wichita Falls and Odessa for convenience of field workers.

MEN IN THE INDUSTRY'S NEWS

H. BOEZINGER, Los Angeles district manager for Pittsburgh Equitable Meter Company and Merco Nordstrom Valve Company, has been elected a vice president of the latter company. He is a graduate of Stanford University, and before his affiliation with Merco Nordstrom Valve Company was engaged in petroleum engineering in the San Joaquin Valley and in Southern California. He has been associated with the company since its early development, and his additional activities will cover the entire west coast.

CHARLES H. PISHNY, Amerada Petroleum Corporation, Tulsa, has been named chairman of the Oklahoma Steering Committee on Oil Field History, Mid-Continent Oil & Gas Association. Members are Robert H. Dott, Oklahoma Geological Survey, Norman; Ralph L. Marek, Stanolind Oil & Gas Company, Tulsa; Foster Morrell, United States Geological Survey, Tulsa; W. L. Rinaman, Oklahoma Natural Gas Company, Tulsa; Vance Rowe, Petroleum Statistical Guide, Inc., Tulsa; G. A. Schwab, Barnsdall Oil Company, Tulsa; Ralph C. Steinman, Sinclair Prairie Oil Company, Tulsa; R. V. L. Stratton, Tide Water Associated Oil Company, Tulsa, and G. V. N. Yates, Indian Territory Illuminating Oil Company, Bartlesville.

WILLIAM W. BRITTON has been named special representative in the Pacific Coast territory for Jessop Steel Company, with headquarters in the Chamber of Commerce Building, Los Angeles. He has been a member of the company's sales staff for many years, and before his transfer to the Pacific Coast represented the company in the southern territory, with headquarters in Dayton, Ohio.

CHRISTIAN JENSON, geologist in the Texas Gulf Coast area for Shell Oil Company raises quail as a hobby.

K. R. BURNS, formerly with Lee Drilling Company, Tulsa, is now in the well logging department of Baroid Sales Division.

A. D. OTTO, manager of Oil Well Supply Company's office at Chicago since 1936, has been appointed manager of the Pittsburgh office. Becoming associated with the company in 1924 as district sales manager at Casper, Wyoming, Otto later filled similar positions at Denver, Calgary (Canada) and Houston. For two years preceding his transfer to Chicago, Otto was assistant manager of stores, Midwest Division, with headquarters at Dallas.

HARRY HEASLEY, 77, active in the oil and gas business for many years, died April 19 at his home in Emlenton, Pennsylvania. At time of his death, he was executive committee chairman and a director of Devonian Oil Company. Heasley entered the oil business in 1889 with C. P. Collins, operating as Worth Oil Company. When Devonian Oil Company was organized, he was made a director and assistant treasurer. Subsequently, he became treasurer. He retired from this office in 1905, but continued as a director. In 1905, he organized Hecla Oil Company, which consolidated with Devonian Oil Company in 1915. Heasley also formed Caney River Gas Company, People's Fuel Supply Company and Kay County Gas Company, all of which merged into Oklahoma Natural Gas Company, of which he was president six years and a director for 20 years.

F. D. SMITH, manager of Oil Well Supply Company's Michigan district for the past five years, has been appointed manager of the company's Eastern division, comprising all domestic oil producing areas east of the Mississippi River. Experienced as a drilling contractor, Smith joined the company in 1928 at Owensboro, Kentucky.

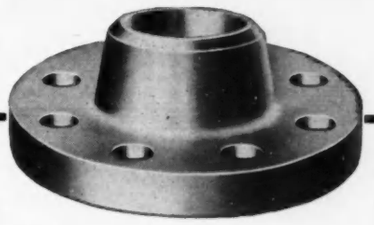
T. R. WEAVER, geologist with American Gas Production Company, Grand Rapids, is vacationing in El Paso, Texas.

JAMES P. DUNNIGAN, president and general manager of Producers Refineries, Inc., has been re-elected mayor of West Branch, Michigan, for his third consecutive term.

H. R. FREUCHTENICT, general superintendent of the gas division of Consumers Power Company, has returned to his home in Mt. Pleasant following a two-month stay in Florida.

J. ROBY PENN was re-elected president of the Texas Pacific Coal & Oil Company, along with the other directors and officers, at the annual stockholders and board meetings held at Fort Worth headquarters April 16.

EDWIN H. PRICE, Los Angeles representative for Manning, Maxwell & Moore, Inc., and a lieutenant commander in the United States Naval Reserves, has been called to active duty. He is serving as assistant supervisor of shipbuilding at the Union Iron Works plant of Bethlehem Shipbuilding Corporation at San Francisco.



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Sensible Rates from $2.50

Squeaks from the Bull Wheel

Short Cut

A wealthy old woman who was very ill sent for her lawyer to make her will.

"I wish to explain about the disposition of my property."

"There, there! Don't you worry about it; just leave it to me."

"I suppose I might as well—you'll get it anyway."

OPM Needs This Expert

"Why do you want such a big sink?"

"Well, when my wife leaves in the summer, she's generally gone for a month."

Shakespeare Knew Seven

"Have you any children?"

"Yas, Sah, Ah's got foah."

"How old are they?"

"Well, now le's see—Ah's got one lap chile, one creeper, one porch chile and one yard young'un."

Not to Tote

"Can you let me have a book, please?"

"Certainly, do you want something light?"

"It doesn't matter a bit," she replied. "I have my car with me."

Bride's Cooking

"What an enormous pie, dear! It looks like a football."

"It's the smallest pumpkin I could find."

Chemistry's Worst

A group in the Signal Corps was discussing the trend of the present war.

It was generally agreed that the research chemists would play an increasingly important part in the future. "Bah!" grunted an old soldier. "Chemists will never produce anything more dangerous than wot they 'ave already."

"What's that?"

"Blondes!"

Nature Lesson

"Do you suppose it's bad luck for a cat to follow you?"

"It all depends; are you a man or a mouse?"

Eyes of The Fleet

Navy Bill had broken with his girl friend. After ignoring several letters requesting the return of her photograph, one came threatening to complain to the captain. Deciding to squelch her for all time, he borrowed all the pictures of girls available on the ship, sending them to her in a large bundle with the following note: "Pick yours out, I've forgotten what you look like."

Well Qualified

Manager—Young man, have you the firmness of character that enables a person to do his duty in the face of ingratitude, criticism, and even ridicule?

Applicant—I should have. I cooked two weeks for a camping party.—Atlanta Two Bells.

From Little Acorns

Out of curiosity, a farmer had grown a crop of flax, and had a tablecloth made out of linen. Some time later he remarked to a visitor at dinner. "I grew this tablecloth myself."

Did you, really?" she exclaimed. "How did you ever manage it?"

It was plain that she had no idea of how tablecloths came into being, so the farmer lowered his voice mysteriously as he replied: "If you promise not to give the secret away, I'll tell you."

The guest was eager to promise.

"Well," proceeded the farmer, "I planted napkins!"

Frank Insurance Buyer

"Do you want a straight life?"

"Well, I like to step out once in a while."

Criticizing a Speech

"You didn't make the most of your opportunities."

"What opportunities?"

"Why, the opportunities you had of sitting down."

Logic

"How are you today?"

"I'd be all right, if it wasn't for rheumatism in my left foot."

"Well, we mustn't complain; you know we're gettin' old, and old age does those things."

"Old age hain't got nothing to do with it. My right foot's jes' as old as my left foot, yet it's sound as a bell."

One Was Married

"I'll bet if I was married I'd be boss and tell my wife where to head in."

"Yes, and I suppose when you get to a railroad crossing you honk your horn to warn the oncoming express to get out of your way, don't you?"

Skeptical

General Zachary Taylor was one of those canny warriors who distrusted the reports of too excitable or imaginative subordinates.

Once when his forces were advancing into Mexico he began to receive rumors of the approach of General Santa Anna with an overwhelming body of men and equipment. Their number was left to the imagination, which always exaggerates the unknown and unseen. One day a highly excited cavalry officer arrived in camp with the report that he had seen 20,000 Mexicans with 250 pieces of artillery.

"Captain," said General Taylor, "do you say you saw that force? The captain asserted he had.

"Well, Captain," remarked the General, "if you say you saw it of course I must believe it; but I would not have believed it if I had seen it myself."

Hoot Hoot!

An owl, planning to visit his lady love, put on all his best clothes, but on coming out of his hole saw that it was raining hard.

Sadly he exclaimed: "To wet-to-woo."

Sounds Simple

"How do you get rid of these awful cooties?"

"That's easy. Take a bath in sand and rub down in alcohol. The cooties get drunk and kill each other throwing rocks.

Frigid Air

An electrician was examining an electric refrigerator that was using too much electricity and could not find the reason.

He idly asked the cook, "How do you like the refrigerator?"

"I like it fine," she said. "I open the door and it cools off the whole kitchen."

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GOTT Water Cans are the practical way to keep drinking water cool for long periods, protected from impurities and always handy to the job. Snug fitting large removable top, strongly built to withstand rough usage. GOTT Water Coolers have extra large covers and a handy non-leaking push button faucet. Your Supply Store has them, get one today!
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Made in 3, 5, 8, 10, and 20 gallon sizes.
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KEEP PURE DRINKING WATER ALWAYS HANDY

"The Entirely Different Boiler and Engine Treatment"

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The Roster of **Sand-Banum** users steadily increases—and previous users extend their use.

Company A used 6 cans the first year and 24 the third year. Company B used 9 cans the first year and 107 the third year.

AND—we have many users who continue to show EXTENSION IN USE SINCE 1926.

SAND-BANUM definitely removes old boiler scale and corrosion—and prevents new—regardless of water or operating conditions. Does it economically, simply and surely. We cordially invite your test.

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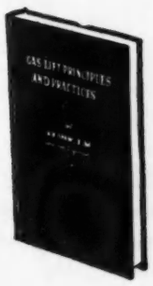
GAS-LIFT PRINCIPLES AND PRACTICES



By S. F. SHAW, E.M.
Consulting Engineer

THIS BOOK is largely based on a series of lectures on gas lift delivered before the Petroleum Engineering Department of the Agricultural and Mechanical College of Texas on November 9th and 10th, 1939, by the author as special lecturer of the Department of Petroleum Engineering.

A history of the development of the air-gas lift is given, covering operations in air and gas-lift, and noting some of the inventions that have been patented in connection with this work.

The performance data in the numerous tables are selected from some 15,000 actual field tests made to determine the best rates at which to produce a well, these tests being made by the author or under his supervision, in many fields of the United States and foreign countries.

The principles controlling operation of the gas-lift are discussed, curves and formulas are given for determining the quantity of gas required to lift liquids, and curves and formulas are given for determining the capacity of various sizes of pipes in certain fields, and methods are discussed for determining similar formulas and curves in new oil fields.

A lengthy discussion of the selection of compressors and building of plants suitable for handling gas-lift operations is given.

CONTENTS:
History and Invention; General Principles Controlling Gas-Lift Operations; Lifting Efficiency; Lift and Submergence; Pressure; The Eductor; Straight or Continuous Gas-Lift; Combination Gas-Lift Flow; Intermittent Gas-Lift Flow; Compressor Plant Installations; Gas-Lift Practices in Various Fields.

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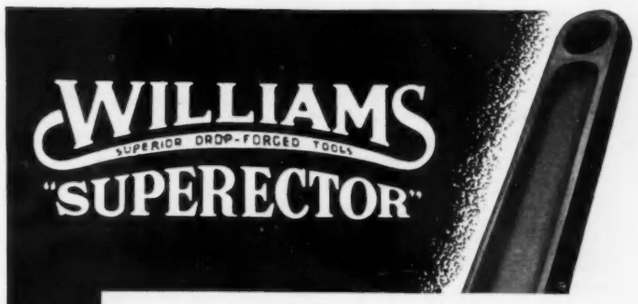

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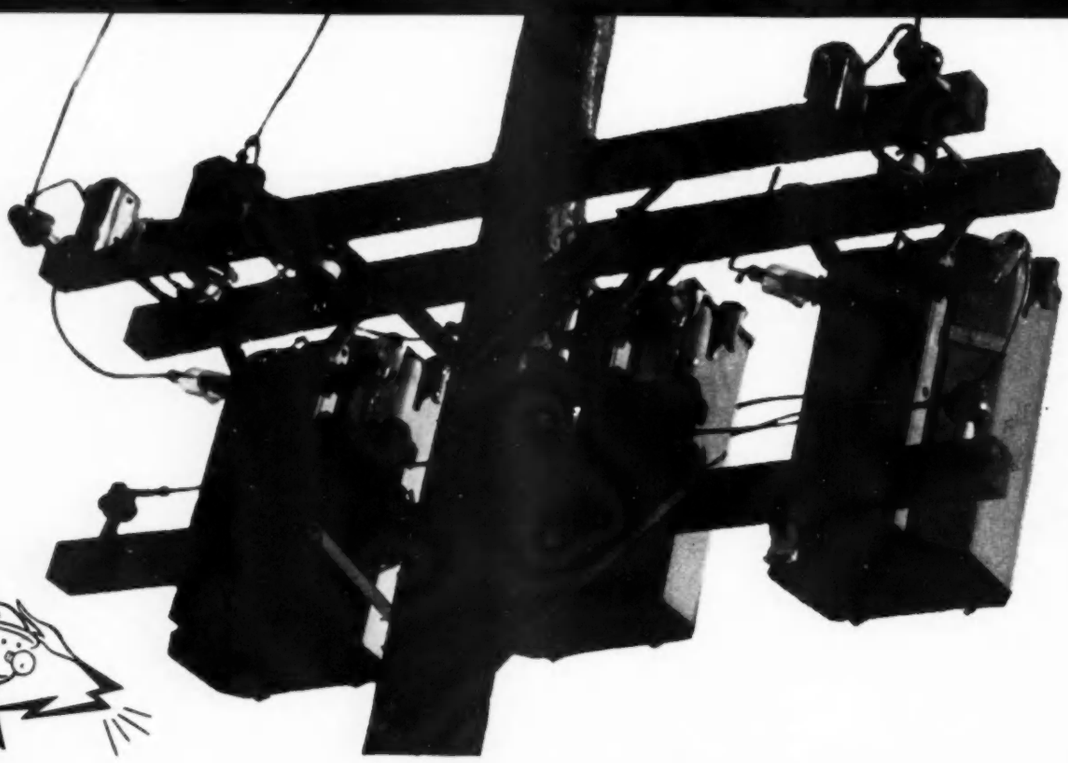

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Box 1498, Oklahoma City, Oklahoma

NOTES FOR THE Equipment Buyer and User

Elevator

WEB WILSON OIL TOOLS

A light-type center-hinge elevator for handling external upset drill pipe has been announced by Web Wilson Oil Tools, Huntington Park, California. It is designed for light medium-depth drilling with portable and slim-hole rigs.

Web Wilson Light Elevator

A latch and heat-treated alloy steel hinge pin are designed to absorb horizontal stress due to wedging action of the tapered pipe shoulder. A spring on the hinge pin is provided to automatically open the elevator when the latch is operated, facilitating operation both in the derrick and on the floor. Design makes it impossible to open the latch with the elevator under load, eliminating the need of a safety catch on the latch.

Floor Patch

TRUSCON LABORATORIES, INC.

A cementitious material for patching holes, ruts and worn places in cement floors, designated Floor-Patch, has been announced by Truscon Laboratories, Inc., Detroit.

In application, unsound concrete is removed with a cold chisel or similar tool; oil, grease or asphalt are removed by a wire brush, and the area is scrubbed out with water. The compound is mixed with water to a consistency of heavy mortar, and a small amount placed in the area to be patched. This is thinned down with water and scrubbed into the entire area with a stiff-bristle broom to provide a bonding coat, after which the entire area is filled with the mixed compound and leveled and finished with a steel trowel.

Lathes

Axelson Manufacturing Company, 6160 South Boyle Avenue, Los Angeles, has issued six new bulletins giving detailed descriptions of various sizes of its heavy-duty 24-speed geared-head lathes. The bulletins show front and rear views of each lathe in large-scale illustrations. Itemized specifications are furnished.

Safety Valve

THE INFERNO COMPANY

A line of 2-inch safety valves in five styles for steam to 350 pounds, 450° F., or for oil, water or gas to 1000 pounds, designated high-capacity type, has been announced by The Inferno Company, Shreveport.

The valves employ stainless-steel stems, malleable-iron bodies with tested tensile strength from 55,000 to 60,000 pounds, and nickel-alloy valves and seats. Srings are chrome-Vandadium-cadmium plated.

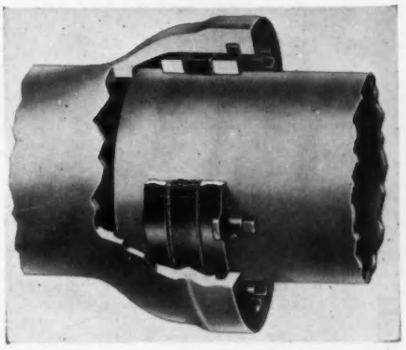
The valves are set for the minimum blow-down designated by the ASME code. A lever and pull cord is provided to encourage frequent testing.

Type HC-TOES-A has a top outlet exposed spring and is designed to diffuse steam upward but away from the spring; type HC-SOES has a side outlet exposed spring and is designed with the spring exposed for inspection and to eliminate all back pressure from the top of the valve; type HC-TOCS has a top outlet with the spring enclosed; type HC-SOCS has a side outlet and is designed for use where steam must be piped away, and type HC-SOCS-CS has a side outlet with spring enclosed, capped and sealed, and is designed for use as a relief valve.

Pipe Joint

DRESSER MANUFACTURING COMPANY

A mechanical joint for use with cast-iron pipe, described as single-gasketed, self-contained, flexible and corrosion-proof, and designated Style 85 Bellmaster, has been announced by Dresser Manufacturing Company, 41 Fisher Avenue, Bradford, Pennsylvania. It consists of an inner ring, armored gasket, outer ring and a set of capscrews, all factory assembled into a single unit.

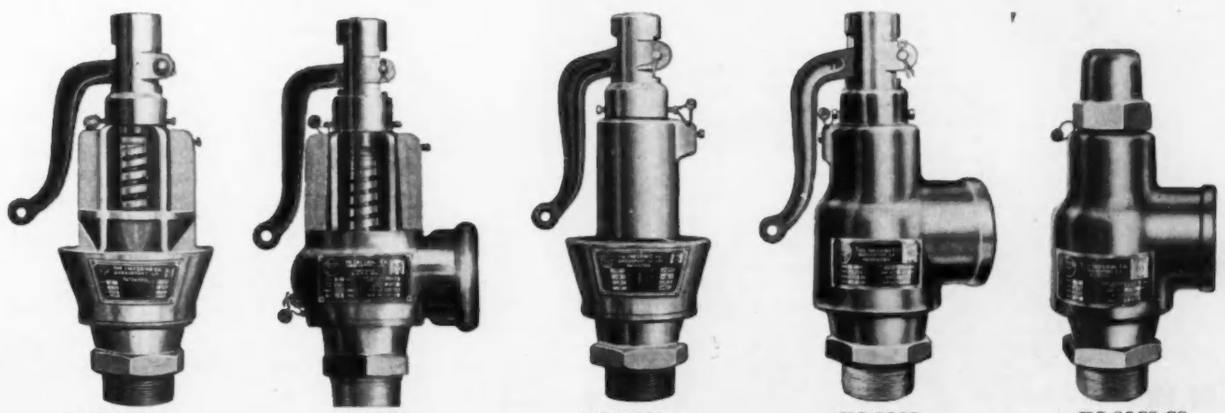


Dresser Style 85 Bellmaster Joint

To install, the joint is inserted in the bell end of pipe prepared to accommodate it, locked in place by twisting slightly clockwise, spigot end "stabbed in," and capscrews tightened. As capscrews are tightened, the inner ring is drawn closer to the locked outer ring, expanding the gasket against the outside of the spigot and against the inside of the bell to make a tight seal. Only a small ratchet wrench is needed to install.

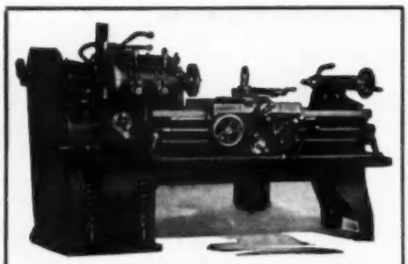
The joint is rated, in smaller sizes, for deflecting through an arc of as much as 18 degrees without impairing tightness or efficiency. The resilient gasket permits deflection in any direction, as well as longitudinal movement caused by expansion and contraction. It is enclosed by the bell of the pipe in which it is inserted.

Style 85 Bellmaster is now available



HC-TOES-A HC-SOES HC-TOCS HC-SOCS HC-SOCS-CS

Five Sizes of The Inferno Company's High-Capacity Type Two-Inch Safety Valves



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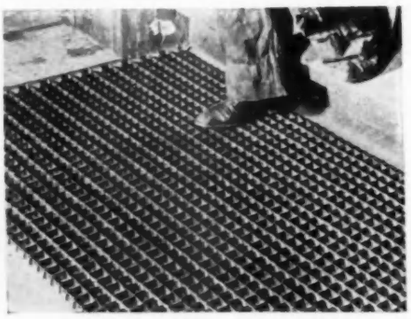
NOTES FOR THE Equipment Buyer and User

in the following pipe sizes, with other sizes to be available soon: 4-, 6-, 8-, 10-, 12- and 16-inch.

Steel Mat

WILLIAM F. KLEMP COMPANY

A steel mat, designed to lie flat on the floor and not to creep or wrinkle, has been announced by William F. Klemp Company, 6601 South Melvina Avenue, Chicago.



Klemp Company's Steel Mat

The mat is made from 5/8 x 0.065-inch steel formed into a 1¼ x 1¼-inch mesh. It is offered cut to any length up to 25 feet and any width up to six feet, and in multiples of those dimensions. Ends of adjacent mats are joined together with a single stringing wire. All edges are turned and finished. The mat is flexible and can be rolled like a rug.

Koehring Company Appoints Clarence L. Boyd Company

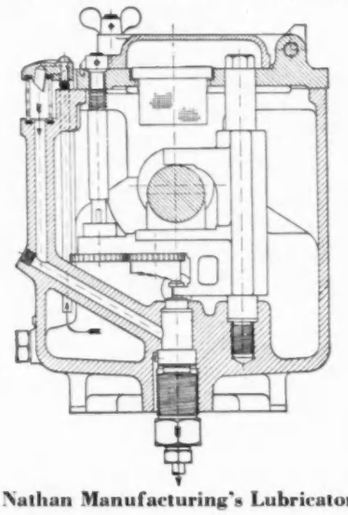
The Clarence L. Boyd Company, with offices at Tulsa, Oklahoma City and Guthrie, has been appointed Oklahoma distributor for Koehring Company, Milwaukee.

Lubricator

NATHAN MANUFACTURING COMPANY

A mechanical lubricator designed for pressures up to 20,000 pounds, designated Type HD, has been announced by Nathan Manufacturing Company, 250 Park Avenue, New York.

The lubricator employs four independent pumping units in the oil reservoir, one for each feed outlet. The pumping



Nathan Manufacturing's Lubricator

units consist of a packless piston fitted oil-tightly into a cylinder. They are designed to draw oil from the reservoir through sight-feed glasses in drops by a vacuum created during the suction stroke. Each pumping unit is actuated by a yoke which, in turn, receives its movement from an eccentric shaft of liberal proportions. The oil can be regulated individually for each feed by adjusting the effective stroke of the pumping pistons.

The lubricator can be provided with either a ratchet drive for reciprocating movement, or with a rotary drive for connection to a motor. It is furnished with from one to four feeds, each rated to operate against a pressure of 20,000 pounds.

Cleaning Guide

B & W, Inc., 3545 Cedar Avenue, Long Beach, California, has issued an 8-page bulletin describing use of wall cleaning guides to improve a primary cement job. Opening pages give technical data and graphic sketches of well sections showing troubles arising from failure to remove the residual mud cake from the wall of the hole, and failure to keep the casing properly centered in the hole during the cementing operation. The bulletin also describes construction, placement and field usages.

Safety Valves

The Inferno Company, Shreveport, has issued a data sheet on its line of high-capacity type 2-inch safety valves for steam to 350 pounds, 450° F., or for oil, water and gas to 1000 pounds.

WEIGHT INDICATOR POINTS

Charts obtained with Rate of Penetration Recorders clearly show the need for *accurate* drilling control instruments.

Penetration speeds vary greatly with changes in weight and in rotating speed. In fact, many times there may be a critical point in weight increase beyond which high penetration rate means *crooked* hole!

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NOTES FOR THE Equipment Buyer and User

Sperry-Sun Well Surveying Opens Three Mid-Continent Offices

New offices have been opened by Sperry-Sun Well Surveying Company at Fort Worth and Lubbock, Texas and at Oklahoma City, to facilitate service in the Mid-Continent area.

J. P. Kelp, who has been placed in charge of the Fort Worth office, is a 1932 graduate of the University of Louvain, Belgium, and in 1934 obtained a science master from the University of Oklahoma. He was a junior engineer with Concordia Oil Company in Rumania in 1931, and from 1934 to 1937 was an engineer with Reed Roller Bit Company. He joined Sperry-Sun Well Surveying Company in 1937. His headquarters are at 2645 Lubbock Avenue.

W. F. Krueger, in charge of the Oklahoma City office, is a 1935 petroleum engineering graduate of the University of Oklahoma. He spent three years with the United States Bureau of Mines at Bartlesville, and the last three years with Sperry-Sun Well Surveying Company. He is making his headquarters at 3020 NW 19 Street.

L. H. Creasy, named head of the Lubbock office, joined the company in 1940. He is a 1936 mechanical engineering graduate of the University of Oklahoma, and after graduation worked with Transwestern Oil Company as a roustabout and petroleum engineer for three years, and later with Eastman Oil Well Surveying Company. His headquarters are at 3207 Twentieth Street.

Cincinnati Rubber Company Names Pittsburgh Distributor

The Cincinnati Rubber Company, Cincinnati, has announced appointment of John Flocker & Company, 644 Grant Street, Pittsburgh, as distributor of its line of industrial rubber products in the Pittsburgh area.

Methods of Study of Sediments, By Twenhofel and Tyler

"Methods of Study of Sediments," by W. H. Twenhofel and S. A. Tyler, is a survey and evaluation of the better methods of study with which the authors are familiar. Techniques are described and developed in such detail as may seem desirable. Some appraisal of results is also incorporated. Sedimentary minerals and rocks are not considered, as these materials are deemed by the authors to have been adequately covered in books previously issued.

The attempt has been made to present a balanced consideration of the different techniques and to avoid undue emphasis on any particular method. Complete balance is difficult to attain, some methods of study requiring detailed consideration because of the importance of the results they yield or because of the nature of the techniques.

The authors prefer certain methods of study to others. They exhibit no hesitancy in stating these preferences, but such personal bias does not affect emphasis placed on various descriptions.

The book was written to serve as a laboratory manual in sedimentation courses and in company and governmental laboratories where sediments are studied. The book is priced at $2, and may be secured through the Book Department of The Gulf Publishing Company, Box 2608, Houston.

Portable Substations

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pennslyvania, has issued Bulletin B-2281, describing portable substations available in voltage ratings up to 69 kv and in capacities up to 4500 kva. Packaged power for present day requirements is described. Typical trailer mounted substations are illustrated with arrows pointing to essential parts. Engineering details such as core and coils, heat exchanges, and automatic protection are explained, and application features are listed.

Pitcured at Eola, Louisiana, with this mess of the Ambloplites Rupestris species (goggle-eye perch to you), are L. A. Pettyjohn, chief clerk for Amerada Petroleum Corporation at Eola; Carl Mount, sales representative for Oil Center Tool Company at Lafayette, Louisiana; Walter M. Beard, assistant district superintendent for Amerada Petroleum Corporation at Eola, and Jimmie Kisling, chief paleontologist in the Gulf Coast District, Houston. The picture was taken by A. J. Penick, president of Oil Center Tool Company, Houston.

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* Indicates that detailed information on the manufacturer's products or services may be found in the 1941 edition of The Composite Catalog of Oil Field & Pipe Line Equipment.